



Water Quality Management Plan 2019

Pikes Peak Region- Colorado



Pikes Peak Area
Council of Governments
Communities Working Together

Water Quality Management Plan
(208 Plan)
2019 Update

Approved by PPACG Board of Directors – November 13, 2019

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1. Executive Summary

The Pikes Peak Area Council of Governments (PPACG) is required under federal and state statutes to develop a Water Quality Management Plan (208 Plan) that recommends future policies and technical strategies for each of the five watersheds within the Pikes Peak region – El Paso, Teller, and Park counties. The 208 Plan recognizes each watershed is uniquely different and water quality problems can be both diffuse and site-specific.

The 2019 208 Plan supersedes the previous plan which was last updated in 2010. The format and structure of the 208 Plan has remained unchanged between 2003 and 2019 and is still broken down into five watersheds to describe site-specific information. The changes in the 2019 208 Plan update include but are not limited to:

- changes to the population projections;
- revisions to the regional policies;
- a revised water quality assessment that identifies the major water quality issues for each watershed;
- a revised description of the point source dischargers and a point source summary sheet for each watershed;
- revised watershed sections that condense information in order to be useful and easier to manage during updates;
- updates to the nonpoint source assessment; and
- revised conclusions and recommendations for each watershed.

Water quality improvements recognized as a result of implementation of the 2010 208 Plan include:

- changes to site applications to address specific water quality issues and concerns as identified in the 208 Plan;
- implementation of recommendations aimed at improving water quality, including changes to local regulations and policies that affect water quality, studies to assess sources of water quality impairment, and further coordination between cities and counties; and
- improved regional collaboration to identify future needs and ensure

water quality will not be impacted as a result of future decisions.

1.1. Development Process

This plan was developed by PPACG with the assistance of PPACG's Water Quality Management Committee (WQMC). The WQMC consists of representatives of special districts and military installations involved with water quality management, along with local governments located within El Paso, Teller, and Park counties. During regular meetings, members reviewed and made recommendations regarding information to be incorporated into the 208 Plan.

1.2. Uses of 208 Plan

A regional approach is important to protecting water quality because it involves multiple groups and individuals and recognizes geographic impacts to problems are not isolated. The importance of providing and promoting regional dialogue, discussion, and solutions is evident by the numerous watershed organizations throughout the region and state. The 208 Plan is a planning document intended to assist local, state, and federal decision makers prioritize and provide information to help guide the region in addressing water quality issues. This process helps assure decisions made at the local and state levels are consistent with pertinent statutory and planning requirements, information necessary for water quality decisions is adequate and up-to-date, and agencies and associations are designated to implement the recommendations.

As such, this plan is used to:

- review site applications and discharge permits to ensure consistency with the recommendations, policies, and future needs of the region;
- educate the cities and counties and the public regarding the future wastewater needs of the region;
- provide information to planners regarding point source and nonpoint source water quality issues and concerns, and applicable policies and strategies;
- determine if proposed state water quality standards are consistent with the policies and goals contained in the plan.
- review the status of water quality within designated areas and report on progress in meeting the local, state, and federal water quality goals

as well as regional policy objectives;

- identify priorities and processes and recommend solutions for addressing water quality problems through special stream studies, including Total Maximum Daily Load (TMDL) or wasteload allocation analyses;
- identify priorities and local needs for improving or constructing wastewater facilities; and
- identify environmental, economic, and social costs and benefits of implementing portions of the 208 Plan goals and objectives.

1.3. Goals and Objectives

The goal of the 208 Plan is to be consistent with the Clean Water Act, which is to restore and maintain the chemical, physical, and biological integrity of waters. This will be accomplished through a regional and coordinated approach that serves to recognize the watersheds in the region as regional assets supporting diverse interests. To achieve this goal, five objectives were adopted as part of this plan:

1. Improve watershed health by developing and implementing strategies that improve water quality and maintain a balance between the natural environment and designated land uses.
2. Restore and maintain the designated uses of the streams and creeks to ensure protection of public health, aquatic life, agriculture, recreation, and surface and groundwater supplies.
3. Identify current and future wastewater treatment needs through a regional collaborative process and implement strategies that improve water quality.
4. Develop solutions that consider environmental, social, and economic impacts to both point and nonpoint source problems.
5. Encourage local governments, special districts, businesses, and other stakeholders within the watersheds to adopt policies and operating practices consistent with the 208 Plan.

1.4. Scope

The 2019 update of the 208 Plan follows the watershed approach initially taken in the 2010 Plan. Information and issues that overlap between watersheds are described in the beginning of the 208 Plan in the following sections: Introduction; Regional Water Quality Assessment; Regional Policies; Population Projections by District and/or Service Area; and Environmental, Social, and Economic Impacts of the Plan.

The remainder of the 208 Plan is divided into four sections corresponding to the five watersheds shown located within the portions of the South Platte and Arkansas river basins within the Pikes Peak region:

- South Platte Headwaters
- Upper South Platte Watershed
- Upper Arkansas Watershed
- Fountain Creek Watershed
- Chico Creek Watershed

The key aspects described in each of these five watersheds are:

- A description and identification of treatment facilities necessary to meet the anticipated municipal and industrial waste treatment needs of the area until 2045, including treatment level requirements;
- The establishment of construction priorities for such treatment facilities and time schedules for the initiation and completion of all treatment facilities;
- The identification of agricultural and forest management-related nonpoint sources of pollution, mine-related sources of pollution, construction activity, and the control and disposition of all residual waste disposal of pollutants on land or in subsurface excavations;
- An identification of management and operating agencies to carry out appropriate portions of the 208 Plan;

- Description of the water quality issues and concerns unique to each watershed; and
- Recommendations for future policy and technical strategies to address water quality issues and concerns.

1.5. Figure: Watersheds in the Pikes Peak Region

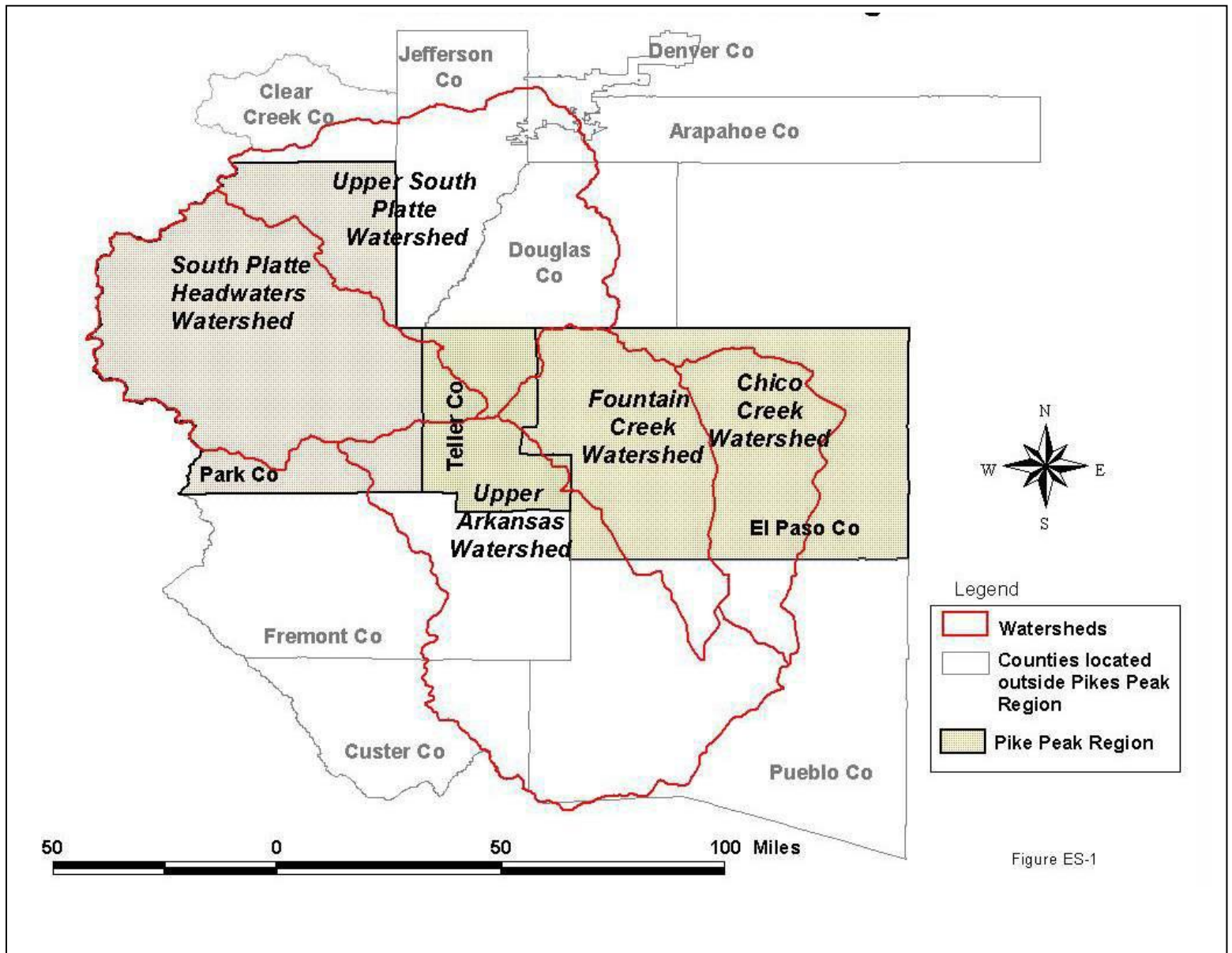


Figure ES-1

1.6. Challenges

The development of the 208 Plan identified the following challenges:

- Complying with future nutrient standards for total phosphorous and total nitrogen, fish tissue-based selenium criteria, ammonia standards for the protection of mussels, and new arsenic standards, all of which will be adopted no later than 2027 by the Colorado WQCC;
- Determining sources of *E. coli* contamination; and
- Conducting adequate water quality monitoring in each of the watersheds to determine future water quality problems.

1.7. Future Plan Revisions and Updates

The 208 Plan will be updated at least every five years. If required, amendments to the 208 Plan will occur between updates of the 208 Plan. Section 25-8-105 of the Colorado Revised Statutes and the Colorado WQCC Policy #98-2 contain language regarding review and approval of amendments to the 208 Plan.

2. Introduction

2.1. Background

The Pikes Peak Area Council of Governments (PPACG) was designated by the Governor of the State of Colorado and the EPA in 1974 as the regional water quality management planning agency for the Pikes Peak region. This is referred to as Colorado State Management Region IV and is a three-county region containing El Paso, Teller, and Park counties. The Pikes Peak region is unique because it includes portions of two different drainage basins – the South Platte River Basin and the Arkansas River Basin.

As the designated water quality planning agency, PPACG is required to prepare and update a Regional Water Quality Management Plan to address regional water quality issues under Section 208 of the CWA. This plan is commonly referred to as the 208 Plan and, as defined in state and federal law, it is a planning document, not a regulatory document. Previous updates to the 208 Plan were completed in 1978, 1981, 1984, 1985, 1989, 1999, 2003, 2007 and 2010. The 2019 208 Plan update supersedes the 2010 update and reflects the dynamic nature and changing conditions in the region.

2.2. Plan Overview

The 208 Plan is used to address water quality and environmental-related issues and to recommend implementation strategies to restore impaired rivers and streams. It is developed through a regional cooperative planning effort which involves representatives from local municipalities and counties, special districts, and state and federal agencies. This process is continuous and iterative.

The 2019 update of this plan follows the watershed approach initially taken in the 2010 Water Quality Management Plan and includes information specific to the five watersheds located within the two river basins in the Pikes Peak Planning Region:

- Within the South Platte River Basin: this includes the South Platte Headwaters Watershed and the Upper South Platte Watershed, which will be discussed together due to their similarities; and
- Within the Arkansas River Basin: this includes the Upper Arkansas Watershed, the Fountain Creek Watershed, and the Chico Creek Watershed, which will each be discussed separately.

The watersheds located within this three-county region are extremely diverse in terms of water quality issues, geology, climate, and topography, and the information considers the diversity within and between each of the five watersheds.

Watershed boundaries were determined by the U. S. Geological Service (USGS) based on a national system of Hydrologic Unit Codes (HUC), which provide a common framework for delineating watersheds and their boundaries (USEPA, 1995).

2.3. Hydrologic Unit Code Watershed Name

11020003	Fountain Creek Watershed
10190001	South Platte Headwaters Watershed
10190002	Upper South Platte Watershed
11020004	Chico Creek Watershed (no active monitoring stations)
11020002	Upper Arkansas Watershed

The watershed strategy is based on the premise that issues are more effectively resolved at a watershed level where factors affecting both upstream and downstream users can be assessed and allows integration of programs and concerns. Information and issues that overlap between watersheds are described in the Introduction; Regional Water Quality Assessment; Regional Policies; and Environmental, Social, and Economic Impacts of the Plan. Population projections contain population forecasts by county for each of the districts. Specific information unique to each of the watersheds is described in individual Watershed Plans, which contains:

- Introduction and overview;
- Water quality analysis;
- Point source dischargers;
- Nonpoint source assessment;
- Management activities and associations; and
- Conclusions and recommendations.

2.4. Section 208 Planning Requirements

This plan will serve to document, inform, and guide water quality-related activities based on a

comprehensive understanding of the critical issues, and is being developed to be consistent with the requirements of Section 208 of the CWA, which states the plans must include but not be limited to the following (CDPHE, 2013):

- The identification of treatment works necessary to meet the anticipated municipal and industrial waste treatment needs over a 20-year period, including treatment requirements, necessary wastewater collection and urban stormwater runoff systems, financial arrangements, and relationship to potential land use;
- The establishment of construction priorities for such treatment works and time schedules for initiation and completion of all treatment works;
- The identification of regulatory programs used for waste management and to manage discharge facilities;
- The period of time necessary to carry out the plan; the costs of carrying out the plan within a specific timeframe; and economic, social, and environmental impacts of carrying out the plan;
- Processes to identify nonpoint sources of pollution including agriculture, silviculture, legacy mining, the control and disposal of residual waste, and the disposal of pollutants on land or in subsurface excavations to protect ground and surface water quality; and
- The identification of management and operating agencies to carry out appropriate portions of a water quality management plan.

2.5. Management Agency Overview

The management agency structure of the 208 Plan is critical for protection of the surface and ground waters of the region. It recognizes the existing governmental and regulatory framework and allows decisions and management at the most appropriate level of control. One requirement of the 208 Plan is to identify roles for management agencies and operating agencies responsible under the law as implementers of the 208 Plan.

Within the Pikes Peak region, both water quality management associations and general-purpose local governments act as water quality management agencies. Once designated by the

Governor and approved by the EPA, functional responsibility for carrying out all or part of the water quality management plan is legally assigned to that entity. Most of the management agencies in the 208 Plan were established in the 1970s and are comprised of local governments and special districts. The focus of these agencies has been primarily point-source issues and concerns.

The designation of management agencies establishes part of the legal basis for delegation of entities with the authority and ability to implement the recommendations of the 208 Plan; however, the authority to make changes to the regulations rests with the Water Quality Control Commission (WQCC).

2.6. Management Groups

The 208 Plan is organized into the following management group structure. Organizations within each of these groups are listed in the water quality management associations and watershed planning groups section for each of the watersheds.

Wastewater Operating Agencies—Operating agencies own and run wastewater treatment facilities and are responsible for the control, collection, treatment, and discharge of wastewater within their district boundaries or service area boundaries. Wastewater operating agencies within Park, Teller and El Paso Counties will be identified within their respective watersheds. Operating agencies are responsible for specific pollution control activities and have individual National Pollution Discharge Elimination System (NPDES), or Colorado Discharge Permit System (CDPS) discharge permits. Smaller wastewater treatment plants with design capacities of 50,000 gallons per day (gpd) (or 0.05 million gallons per day(mgd)) are described in the plan but not recognized as designated operating agencies.

Management Agencies/Associations—Water Quality Management Associations and/or Agencies (WQMAs) are comprised of individual municipal governments, watershed associations and authorities, general-purpose governments, and special districts responsible for wastewater planning and activities that affect water quality. These agencies (collectively or individually) have the ability to carry out the provisions of Section 208(c)(2) of the CWA and are also responsible for review and recommendations regarding site applications and water quality issues. The current WQMAs in the Pikes Peak region primarily consist of special districts that focus on point source issues within each of their respective areas. In the absence of a designated management agency for each watershed, a county, municipality, or other management agency is designated those powers until one is formed. The authorities given to

the management agency according to the CWA are:

- Implement the point and nonpoint features of the 208 Plan;
- Manage wastewater treatment works and related facilities effectively;
- Design, construct and operate wastewater treatment works and related facilities;
- Accept and utilize grants or other funds from other sources for waste treatment management processes;
- Raise revenues, including the assessment of waste treatment charges;
- Assure each participating community pays its proportionate share of treatment costs;
- Incur short- and long-term indebtedness;
- Refuse to receive wastes from any municipality or subdivision that does not comply with the provisions of the CWA; and
- Accept industrial wastes for treatment.

The locations of the WQMAs were historically based on service area or political boundaries and therefore do not correspond with watershed or subwatershed boundaries. The basic philosophy that guided the structuring of management agencies was composed of three major elements (PPACG, 1989):

- Whenever existing management agencies can be used to properly perform a management function, they should be used.
- The provision of services at the most local level of government is considered to be, in most cases, the ideal combination of efficiency and representation of people.
- A degree of overall coordination and planning is required in order to maximize the performance of existing agencies and service providers.

Land Use Authority—This remains with the towns, cities, or counties responsible for oversight of water quality concerns regarding land use in their jurisdictions, unless this power is given to a special district.

Watershed Groups and Organizations—These are agencies or organizations that address water quality concerns but are not given any specific authorities under the 208 Plan. Most of the watershed groups in the region primarily address nonpoint source issues and concerns.

2.7. Roles and Responsibilities

2.7.1. Pikes Peak Area Council of Governments (PPACG)

PPACG serves as a regional forum for the identification, discussion and resolution of water quality management issues confronting local communities. PPACG will continue to:

- review, update, and amend the 208 Plan;
- support and participate in watershed-based water quality planning processes;
- encourage and assist local governments in developing and reviewing regulations and policies that address water quality issues;
- facilitate intergovernmental agreements that will further watershed water quality planning;
- provide technical support in development of water quality improvement projects;
- review water quality standards and state policies and regulations that affect water quality;
- assist with the development and implementation of nonpoint source and stormwater control programs conducted by local governments;
- assist designated management and operating agencies; and
- review site applications and discharge permits to assure discharges to a stream segment are treated in accordance with the approved 208 Plan. Work with stakeholders to determine if existing water quality standards and classification designations are appropriate;
- Make recommendations to the WQCC on proposed changes to stream classifications and standards; and
- Apply for grants or other funding mechanisms to strengthen existing policies and regulations or capital improvement projects to help

achieve compliance with water quality standards.

PPACG recognizes the pressing concerns for nonpoint source issues in the region and the need to take an active and lead role in building towards long-term solutions. PPACG seeks to build public awareness of water quality management issues through public education.

PPACG will update the 208 Plan every five years, with amendments being processed on an as-needed basis but not more frequently than one every six months. The requirements to amend the 208 Plan shown in Appendix B are made in accordance with the Clean Water Act and Colorado Water Quality Control Act.

2.7.2. Water Quality Management Committee (WQMC)

Members of the WQMC assist with water quality planning issues and development of the 208 Plan and give advice and recommendations on the 208 Plan. Representation on the WQMC includes special districts, military installations, and representatives of El Paso, Teller and Park counties. WQMC members review requirements for 208 Plan amendments and propose changes to wastewater discharge permits, site applications, stream classification/standards, and any other projects impacting water quality. The Site Application Review Committee (SARC), a subcommittee of the WQMC, reviews and makes recommendations on all site applications in the Pikes Peak region. This includes new wastewater treatment facilities, expansion of existing facilities, lift stations and interceptors.

2.8. State and Federal Regulations and Programs

2.8.1. Federal Clean Water Act (CWA)

The CWA was originally enacted in 1972, with amendments in 1977, 1981, and 1987, to restore and maintain the chemical, physical, and biological integrity of the nation's waters. The 1987 amendments to the CWA authorized states to develop and implement nonpoint source pollution management programs. This act also required states to establish water quality standards that protect the beneficial uses of a waterbody and assign a numerical or a narrative statement describing the maximum concentrations of various pollutants.

Under the CWA, wastewater treatment plants are required to meet specific discharge standards set by the Environmental Protection Agency (EPA) before treated effluent is discharged. Under NPDES, facilities are required to sample and monitor discharges for contaminants such as suspended solids, dissolved organic matter, bacteria, pH, residual chlorine, oil and grease, heavy metals, and cyanides to make certain the contaminant levels are

reduced to legally acceptable levels prior to discharging the wastewater.

Responsibility for carrying out the NPDES Program under Section 402 of the CWA, which includes review and issuance of NPDES stormwater and wastewater permits, is under the authority of the Colorado Department of Public Health and Environment (CDPHE). The issuance of these permits must be consistent with the 208 Plan.

2.8.2. Section 404, Dredge or Fill Permits

Section 404 of the CWA requires permits to be issued for the discharge of dredge or fill material to streams/creeks and waters of the United States. These permits are issued by the U.S. Army Corps of Engineers (ACOE) and are also required if wetlands are impacted through dredge or fill material or use of heavy equipment.

The ACOE can issue several different types of permits: Letter of Permission, Individual Permits, General Permits—Nationwide and Regional, Emergency Permits, and After-the-Fact Permits. PPACG reviews the issued permits for consistency with watershed plans and the 208 Plan to ensure they do not cause water quality degradation or impacts to downstream communities.

2.8.3. Colorado Department of Public Health and Environment (CDPHE) Regulations and Policies

The importance of the 208 Plan in addressing regional water quality impacts is reflected in existing state policies. The Colorado Water Quality Control Act (CRS Sections 25-8-101 through 25-8-702) provides the policy directive to conserve, protect, maintain, and improve, where necessary and reasonable, the quality of state waters.

The CDPHE is the delegated permitting authority for the NPDES permit program, including wastewater and stormwater permits for all areas except federal facilities. The EPA is the permitting authority for any federal facility, including military installation permits, which include Fort Carson and the USAF Academy, located in the Fountain Creek watershed. These permits must address all federal and state water quality standards and regulations.

A Guide to Colorado Programs for Water Quality Management and Safe Drinking Water, WQCC Policy #98-2, presents policy direction for regional water quality planning agencies and the content of Section 208 Water Quality Management Plans, as stipulated in Section 208 of the CWA. PPACG works cooperatively with other organizations and councils of governments that border our 208 Planning Region on studies and activities within our watersheds. More information can be found at: https://drive.google.com/file/d/18Tbk_kKdR-

The Water Quality Control Commission is the administrative agency responsible for developing water quality policy in Colorado that implements the Colorado Water Quality Control Act. The WQCC adopts water quality classifications and standards for surface and ground waters of the state, as well as various regulations aimed at achieving compliance with those. The 208 Plan is consistent with state regulations and policies, including the NPDES permit program requirements.

2.8.4. Site Applications

As the planning agency for the region, PPACG is required to review site applications and discharge permits. The requirements for site applications are contained in WQCC Regulation #22, Site Location and Design Approval Regulations for Domestic Wastewater Treatment Works, this document and in other CDPHE policies and guidance documents. This includes:

- Regulation #22 – Site Location and Design Approval Regulations for Domestic Wastewater Treatment Works; and
- WPC-DR-1 – Design Criteria for Domestic Wastewater Treatment Works.

This information can be found at:

<https://www.colorado.gov/pacific/cdphe/waterqualitycontrol-commission-regulations>

<https://www.colorado.gov/pacific/cdphe/wqcc-policies>

PPACG and the WQMC review all site applications and make a recommendation to the PPACG Board of Directors for action prior to review by the CDPHE. The procedures PPACG uses to review site applications are shown in Appendix A. A list of all site applications reviewed and approved since the last update of the 208 Plan in 2010 is shown in Appendix D.

2.9. Statewide 208 Plan

The CDPHE approved the Statewide Water Quality Management Plan in June 2011 that provides a framework for water quality planning based on federal regulation at Section 130.6 of Title 40 of the Code of Federal Regulations (40 CFR 130.6). The Statewide 208 plan discusses Division programs and activities associated with the following specific elements defined in 40 CFR 130.6: water quality management agencies; effluent limitations; TMDLs;

municipal and industrial waste treatment; nonpoint source management and control; water quality management plan implementation measures; dredge and fill; and ground water.

The Statewide 208 Plan also provides a comprehensive look at water quality across the entire state as well as more specific water quality information for the seven river basins in the state. This comprehensive water quality information is compiled from a number of information sources.

The Division has since transitioned to a more resource efficient method for providing state-scale planning information through the Watershed Rapid Assessment Program (WRAP) on Colorado State University's Environmental Resource Assessment and Management System (eRAMS) platform. .

The WRAP tool is used to extract, organize, and analyze data and information at various statewide, regional, and watershed scales for readily available geospatial characteristics as well as water quantity and quality. These characteristics include current and historic land use, population, climate, climate projections, stream flow, and stream water quality. The integrated assessment of watershed health is then broken down into six primary attributes: landscape condition, habitat, hydrology, geomorphology, water quality, and biological conditions. Utilizing the extracted data, the WRAP tool calculates a number of indicators for these attributes (for example, median summer nitrate concentration as an indicator of water quality) to create an overall summary of the watershed condition. This overall condition can then be used at a state-wide scale to identify and prioritize management actions similar to the basin plan sections of the 2011 Statewide 208 plan.

2.10. Stormwater Management

Colorado is authorized by the EPA to administer the NPDES program, including stormwater discharge permits. Colorado's permit program is known as the Colorado Discharge Permit System (CDPS) and is the state equivalent of the NPDES permit program. The state generally follows the federal rules for stormwater permitting but uses state application forms and requires permit fees. Whenever feasible, the implementation of green infrastructure should be utilized to reduce the negative environmental impacts of stormwater runoff. The EPA defines green infrastructure as "management approaches and technologies that utilize, enhance, and/or mimic the natural hydrologic cycle processes of infiltration, evapotranspiration and reuse" (USEPA, 2008). It incorporates vegetation and natural resources as much as possible in development and redevelopment. Green infrastructure has several benefits, including reduced

runoff, groundwater recharge, improved air quality, better aesthetics, reduced costs, reduced impacts on climate change, and improved water quality.

2.11. Plan Implementation

Recommendation and implementation of policies and protection strategies require the support of all local governments and stakeholders. All recommendations contained in the 208 Plan are consistent with the goals and objectives of the CWA, Colorado Water Quality Act, and regional watershed programs. A description of the roles and responsibilities of the agencies and organizations is included in the plan.

The service area boundaries shown in the 208 Plan reflect a 20-year planning horizon and may or may not be the same as the district or jurisdictional boundaries. Potential changes to the service area boundaries are reflected in the future needs assessment of each of the watershed sections.

3. Regional Water Quality Assessment

3.1. Overview

This section provides a regional water quality assessment, gives an overview of water quality standards and classifications for surface water and groundwater, and describes the process for development of water quality-impaired stream segments and applicable state regulations and policies regarding water quality.

3.2. Standards and Classifications

Colorado streams are divided into individual stream segments for classification and standards identification purposes. Segmentation occurs either at some easily defined geographic point or at a point where some physical or chemical factor changes the character of the watercourse significantly.

3.3. Surface Water

The water quality classification and standards rulemaking hearings, which establish basic and basin-specific standards, occur once every five years on a rotating basis.

- Regulation # 31: Basic Standards and Methodologies for Surface Water (5 CCR 1002-31) was last updated in December 2018; the next rulemaking hearing is scheduled for June 2021.
- Regulation # 32: Classifications and Numeric Standards for Arkansas River Basin (5 CCR 1002-32) was last updated in August 2018; the next rulemaking hearing is scheduled for June 2023.
- Regulation # 38: Classifications and Numeric Standards for South Platte River Basin (5 CCR 1002-38) was last updated in January 2018; the next rulemaking hearing is scheduled for June 2020.

The issues scoping hearing occurs in October two years preceding the rulemaking hearing and the issues formulation hearing occurs in November of the year preceding the rulemaking hearing. These hearings identify and finalize the issues that will be evaluated during the rulemaking hearings.

Under the CWA, every state must adopt water quality standards to protect, maintain, and improve the quality of the nation's surface waters. These standards represent a level of water

quality that will support the goal of “swimmable/fishable” waters. Colorado’s water quality standards include four major components:

- Numeric criteria set the maximum acceptable concentrations of specific pollutants in streams, lakes, and reservoirs and limit the toxicity of waste discharges to aquatic species without adversely impacting its designated uses.
- Narrative criteria describe the water quality goals for all state surface waters in a list of six general statements. Narrative criteria currently exist for sedimentation.
- Antidegradation provisions establish additional protections for higher quality waters to protect them at their existing quality.
- State Use Classifications (WQCC Regulation #31) consist of categories of uses for which surface waters are to be protected. Colorado recognizes the following classifications:
 - Recreation: Class E - Existing Primary Contact Use; Class P - Potential Primary Contact Use; Class N - Not Primary Contact Use; and Class U - Undetermined Use.
 - Agriculture.
 - Aquatic life protection: Class 1—Cold Water Aquatic Life, Class 1—Warm Water Aquatic Life, and Class 2—Cold and Warm Water Aquatic Life. Class 1 waters are currently capable of sustaining a wide variety of warm or cold-water biota, including sensitive species and Class 2 waters are not capable of sustaining a wide variety of warm or cold-water biota, due to physical habitat, water levels, or uncorrectable water quality conditions.
- Domestic Water Supply.

A single stream segment is usually protected for several uses. Protection of each use requires a different numeric criterion for each chemical constituent. The most sensitive designated use drives the final standard for a water quality parameter on a segment; meaning the lowest numeric standard of all uses is adopted because it is most protective of human or

environmental health.

Standards are designed to protect the associated classified uses of the streams; for example, a stream segment classified for Cold Water Aquatic Life Class 1 is expected to maintain a population of cold-water fish. Such fish require relatively high dissolved oxygen (DO) concentrations year-round and even higher concentrations during spawning season. A water quality standard for DO on such a segment would include a minimum numeric criterion of 6 mg/L for DO year-round with a seasonal criterion of 7 mg/L for DO during the spawning season. Most criteria, such as those for metals, represent maximum allowable limits.

Stream classifications can only be downgraded if it can be demonstrated that the existing use classification is not presently being attained and cannot be attained within a twenty- year time period (Section 31.6(2)(b)). A use attainability analysis must be performed to justify the downgrade.

Temporary modifications to numeric standards can be adopted if a current standard is not being met, where there is uncertainty regarding the standard needed to protect the use, and the WQCC believes the existing quality of a segment can be improved. Temporary modifications are re-examined at least once every three years.

PPACG will continue to assess the impacts of how changes in water quality standards get reflected in stormwater and wastewater permits.

3.3.1. Basic Standards

There were many changes made to the Basic Standards and Methodologies for Surface Water, Regulation #31, during rulemaking hearings held between 2010 and 2019. Some of the most significant changes include:

- *Updates to the process for establishing discharge-specific variances.* The discharge-specific variance provisions which became effective January 1, 2013, were updated based on the EPA's 2015 update.
- *Adoption of nutrient standards in Regulation 31 and Regulation 85.* Nutrient criteria for total nitrogen, total phosphorus and chlorophyll-a were adopted into Regulation 31 in 2012, although EPA only approved a portion of these standards. Additionally, technology based limitations for total inorganic nitrogen and total phosphorus were

adopted into Regulation 85, also in 2012.

- *Adoption of the Voluntary Incentive Program for Nutrients.* The WQCC adopted an incentive program as Policy 17-1 to encourage dischargers to go beyond the requirements of Regulation #85. Under this program, dischargers can earn additional compliance schedule time for meeting the eventual Regulation #31 nutrient criteria which will be adopted in 2027. More information can be found at <https://www.colorado.gov/pacific/sites/default/files/Policy17-1.pdf>
- *Changes to ambient based standards process.* The WQCC adopted revisions to this process to identify two types of ambient based standards (feasibility based and a natural or irreversible quality based) and to provide clarity regarding the analysis and documentation required.
- *Antidegradation.* The WQCC removed the water supply parameters of dissolved iron, dissolved manganese and sulfate from the antidegradation requirements as they are not part of the fishable/swimmable portion of the CWA.
- *Updates to the temperature standards.* The WQCC adopted new definitions of existing quality and updated the acute and chronic cold and warm water standards.

3.3.2. Environmental Protection Agency (EPA)

EPA has adopted new criteria for cadmium, ammonia (mussels based) and selenium (fish tissue based) that the WQCC will review for adoption. For cadmium, the new criteria is slightly less stringent than the previous criteria at hardness concentrations greater than approximately 50 mg/L. The WQCC will likely be adopting this criterion statewide in December 2019. The mussels-based ammonia criteria are expected to be significantly more stringent than the current ammonia criteria and is under review and development by the WQCD. The fish-tissue based selenium criteria is more stringent than the current selenium criteria and is also being evaluated by the WQCD. Both of these are expected to be proposed to the WQCC in 2027.

3.3.3. Other Future Regulatory Action

Based on EPA's 2016 partial disapproval of the Regulation #31 nutrient standards for total nitrogen and total phosphorus for streams, which was adopted by the WQCC in 2012, the WQCD is working on developing new nutrient criterion. The new criteria is expected to be more stringent than standards adopted in 2012. For rivers and streams, the WQCD intends to have draft criteria ready in 2025 and a proposal in front of the WQCC in 2027. For lakes and reservoirs, criterion is expected in 2022.

3.4. Groundwater

Numeric standards for groundwater are different than for surface water and are based on classifications of: Domestic Use Quality, Agriculture Use Quality, Surface Water Quality Protection, Potentially Usable Quality, and Limited Use. Standards are established to protect classified uses. An "Interim Narrative Standard" is used for all groundwater in which standards have not already been assigned in the state. This information is discussed in:

- Regulation #41: The revised Basic Standards for Groundwater (5 CCR 1002-41), was last updated in November 2016, and reviewed in May 2019; the next rulemaking hearing is scheduled for April 2020.
- Regulation #42: Site Specific Standards for Groundwater (5 CCR 1002-42), was last updated in May 2018, and was reviewed in May 2019; the next rulemaking hearing is scheduled for April 2020.

Regulation #41 contains the basic standards for groundwater and interim narrative standards to protect these groundwaters prior to the adoption of use classifications and numeric standards for specific areas. Regulation #42 contains the specific areas where groundwater standards and uses were adopted. Regulation #42 applies to the following locations in this 208 Plan area in El Paso County:

- Fountain/Security/Stratmoor Hills/Widefield Wellfields
- Upper Black Squirrel Creek Alluvial Aquifer
- Upper Cherry Creek and Denver Basin Alluvial Aquifers
- Woodmoor Water and Sanitation District Wellfield

In April 2018, the WQCC adopted site-specific standards for perfluorooctanic acid (PFOA) and

perfluorooctane sulfonate (PFOS) for the Widefield Aquifer. This is the Fountain/Security/Stratmoor Hills and Widefield Wellfields identified above. The WQCC also expanded this area to include areas that contribute groundwater to the Widefield Aquifer.

Currently, Onsite Wastewater Treatment Systems (OWTS) of greater than 2,000 gallons per day are required to be reviewed by CDPHE and PPACG, and usually require nitrate limits of 10 mg/l. The effluent limits are established during the CDPHE review and approval of the site application associated with these higher-flow OWTS. The CDPHE OWTS Working Groups are currently evaluating if a different approach, such as a risk-based approach, should be used to evaluate these systems.

3.5. Water Quality Data Collection

Water quality data is collected by several local, state and federal agencies.

- The United States Geological Survey (USGS) collects water quality data at many of the monitoring stations throughout each of the watersheds. Information is available at the following website:
<http://waterdata.usgs.gov/co/nwis/rt>
- The CDPHE conducts periodic water quality monitoring; more intense monitoring is usually conducted a year or so in advance of a basin rulemaking hearing.

3.6. Unregulated Pollutants

Within Colorado and throughout the United States, water quality standards currently do not exist for some water quality pollutants. As more water quality data is collected and studies are conducted, additional standards will be developed. It is difficult to determine what new standards will be in place prior to the next update of the 208 Plan and their potential impacts. PPACG will continue to participate in working groups to assess potential trends and recommendations by the WQCD to the WQCC.

3.6.1. Emerging Contaminants

Emerging contaminants (ECs) are chemicals recently discovered in numerous water bodies throughout the United States. Some of these substances may represent a potential environmental or public health risk, although in many cases adequate data does not yet exist to determine which substances pose a risk or how significant that risk might be. ECs come from

products used every day in our homes, farms, or businesses and include detergents, fragrances, prescription and non-prescription drugs, disinfectants, and pesticides. More information on emerging contaminants can be found at <http://toxics.usgs.gov/regional/emc/index.html>

3.6.2. Sediment

The CDPHE does not have any regulations or standards for sediment, although Policy 98-1 (CDPHE-WQCD, 2014) provides guidance to address sediment levels and general language within the State of Colorado's Basic Standards and Methodologies for Surface Waters. Policy 98-1 applies a narrative standard to address the effects of deposited sediment on classified uses. The narrative standard states "surface waters shall be free from substances attributable to human-caused point sources or nonpoint source discharge in amounts, concentrations or combinations which for all surface waters except wetlands can settle to form bottom deposits detrimental to the beneficial uses.

Depositions are stream bottom buildup of material which include but are not limited to anaerobic sludges, mine slurry or tailings, silt or mud" (CDPHE-WQCD, pg. 3, 2005).

Although policies currently govern sediment loads within the watersheds, in the near future this could become a more prominent numeric constraint. Studies need to be conducted to determine stable sediment threshold levels.

3.7. 305(b) Report

Section 305(b) of the CWA requires states to prepare and submit a report biennially to EPA on the status of water quality within the state. The WQCD's Integrated Water Quality Monitoring and Assessment Report, released in 2018, is the latest version of its 305(b) Report. The report provides a means for states to report to EPA and Congress on the quality of their waters, the status of water quality management programs, the environmental impacts, and the social and economic costs and benefits associated with achieving the objectives of the CWA. The report can be found at: <https://www.colorado.gov/pacific/cdphe/wqcc-reports-and-plans>

3.8. 2018 303(d) List and Total Maximum Daily Loads and 2018 Monitoring and Evaluation List (Regulation #93)

3.8.1. Background

Section 303(d) of the CWA requires states to submit to the EPA a list of waters that do not or may not meet water quality standards. This is used to set pollution abatement program

priorities and must be done for stream segments where technology-based controls for point sources and controls for nonpoint sources are not able to meet the standards. The 303(d) list identifies priority waters requiring a Total Maximum Daily Loads (TMDLs) process be initiated. A TMDL process is a mechanism to allocate pollutant loads, or potential pollutant loads, among all identified sources in a manner that the combined discharges do not cause the water quality standards for a given waterbody to be exceeded under existing and future conditions. To control the pollutant levels, TMDLs are included in discharge permits. TMDLs are not required for a waterbody unless the waterbody appears on the 303(d) list and are only required for those parameters for which the waterbody is listed.

Waterbodies are considered impaired if they do not meet the water quality uses and standards assigned to them. The listing and delisting criteria are contained in the 303(d) Listing Methodology, which is typically updated every two years prior to developing the 303(d) list. All 2018 303(d) segments specific to each watershed are listed in the corresponding water quality analysis section for each watershed. A map identifying the location of each of these stream segments is included in the Water Quality Analysis Sections for each of the watersheds.

Stream segments lacking sufficient information to determine the source of pollution, but where there are still concerns with attaining water quality standards, are placed on the Monitoring and Evaluation list. This list identifies waterbodies may have water quality problems but where uncertainties within various evaluation criteria necessitate further evaluation.

3.8.2. TMDL Development

The five steps in TMDL development are:

1. Select the pollutant to consider,
2. Estimate the assimilative capacity of the waterbody,
3. Identify the contribution of the specified pollutant from all significant sources,
4. Analyze the information to determine the total allowable pollutant load, and
5. Allocate (within a margin of safety) the allowable pollution among the sources so water quality standards can be achieved.

3.8.3. TMDL Implementation

Implementation of the TMDL requires participation from all the stakeholders. The point source waste load allocation portion of the TMDL can be implemented through effluent limits in discharge permits. Nonpoint sources are implemented through voluntary BMPs and other locally enacted controls which target a specific reduction in pollutant loading.

The PPACG regional planning process recognizes TMDL implementation requires significant stakeholder involvement in collecting and evaluating information and making recommendations. It is anticipated that existing and future water quality management associations and watershed groups will evaluate water quality issues in streams; the need for additional and/or special monitoring; water quality standards; effects of NPDES discharge standards; and will participate in the collection of water quality data. This has been highly successful and effective in the Fountain Creek Watershed, where concerns by the stakeholders and improvements in technology have improved water quality. TMDL implementation activities being conducted are discussed in the water quality sections for each watershed.

TMDL implementation requires complete water quality characterization to determine specific sources that need to be targeted so water quality improvements can be made in a cost-effective manner. For many stream segments, there is a lack of sufficient water quality data to assess the specific sources to target. Stream segments will continue to be assessed to differentiate between natural and anthropogenic sources.

4. Regional Policies

One of the requirements of the 208 Plan (40 CFR Section 130.6 and WQCC Policy #98-2) is to recommend strategies and solutions to address point and nonpoint source problems to protect public health and the environment. This section describes seven regional policy statements for issues identified as affecting water quality in the region and is intended to provide a common and consistent basis to approach water quality planning and decision making in the region. Each issue contains 1) a policy statement; 2) a description of the purpose and importance; 3) a summary of current applicable local, state, and federal regulations and policies; 4) objectives of the policy; and 5) implementation recommendations. The policy statements are designed to guide and promote integrated solutions within each watershed to improve water quality in the region. It will primarily be the responsibility of PPACG, wastewater operating agencies and management agencies/associations, watershed groups, and governmental entities to implement the recommendations and integrate them into future planning efforts.

Specific technical recommendations are also made in each of the individual watershed sections. The seven issues addressed are:

- Land Use Planning and Development
- Riparian and Wetland Areas
- Source Water Protection for Public Water Supplies
- Flooding and Stormwater Management
- Agriculture and Silviculture
- Wastewater Treatment Facilities
- Onsite Wastewater Treatment Systems

Implementation recommendations discussed in this section are applicable to all watersheds, although some recommendations are already being implemented. Recommendations contained in each section are consistent with federal and state regulations regarding water quality and focus on direct and indirect impacts to water quality. Projects should be reviewed for consistency and conformity with these recommendations. Specific recommendations unique to each of the individual watersheds are contained in each of the watershed-specific sections.

4.1. Land Use Planning and Development

4.1.1. Policy Statement

The surface and groundwaters of the region shall be protected from development and design practices that could cause significant degradation of existing water quality or impair the designated uses of the streams; those currently not in compliance will be brought into compliance as soon as it is technically and financially feasible.

4.1.2. Purpose and Importance

The purpose of this policy is to ensure a balance exists between the protection of water quality and land use (specifically development and design practices) and to minimize potential conflicts between the two. Individuals exercising their private property rights should not endanger public health and welfare and the right to enjoy and use common natural resources such as high-quality water and aquatic life.

Land use practices have impacts on water quality. The water pollutants of concern with respect to land use practices include sediment, nutrients, animal wastes, heavy metals, petroleum products, salts, pesticides, temperature, Biological Oxygen Demand (BOD), and the loss of natural protection against these pollutants (such as loss of wetlands and riparian vegetation). These pollutants are nonpoint source in origin (i.e., they typically enter the waterbody via diffuse runoff) and involve a wide variety of landowners, both urban and rural.

Generally, it is more cost effective to prevent water quality impacts through proper planning practices than to treat water quality impacts. This recognition is important because limited funds are available in the prevention and treatment of water quality impacts. The most effective way of addressing land use impacts on water quality is through the development, consistent application, and enforcement of local regulations and incentives to minimize water quality problems from runoff. Most of the implementation recommendations consist of BMPs, both structural and nonstructural. BMPs prevent or minimize the entry of pollutants into the region's ground and surface waters.

4.1.3. Summary of Policies and Practices

All local governments require a complete drainage plan for new developments. The requirements of each drainage plan differ, and although there are no state requirements

(Colorado Revised Statutes do authorize municipalities and counties to consider such requirements), most drainage plans consider on- and off-site drainage improvements, assume full development of any proposed development upstream, and place all costs of improvements on the developer.

The City of Colorado Springs and El Paso County have Drainage Criteria Manuals to regulate development practices and contain requirements for grading disturbances greater than one acre. The City's Drainage Manuals were revised in 2013.

Strategies to improve land use planning and development practices and improve water quality should be considered by cities and counties. This includes adoption and implementation of low-impact development (LID) practices, adopting smart growth principles, and promoting green infrastructure, energy star housing, and Leadership in Energy and Environmental Design (LEED) criteria for nonresidential structures. Cities and counties also require specific setbacks—although the distance differs in each community—from streams and wetlands. The City of Colorado Springs' 2016-2020 Strategic Plan outlined the following City Roles to reach objectives outlined in the plan to include:

- Update the City's Comprehensive Plan (which was accomplished in 2018), and develop a 10-year facilities master plan, which is not completed to date.
- Improve environmental sustainability of City infrastructure and assets.
- Commit to developing a sustainable and resilient stormwater system which maximizes the utilization of existing infrastructure, while implementing policies and procedures that facilitate preventive maintenance of systems.
- Collaborate with the Infill and Revitalization Steering Committee to support and incentivize infill and manage growth/sprawl by restructuring development fees and agreements.
- Modernize development review processes internally, and evaluate regulations, fees and rules, using best practices, in cooperation with other entities outside City government who are involved in the process.

The City and El Paso County are working together on revising and updating the City's Annexation regulations.

4.2. Objectives

The objectives of the policy are:

- To minimize site disturbance on lands adjacent to surface waters, wetlands, and riparian environments in order to protect water quality;
- To ensure activities such as development, mineral extraction, solid waste disposal, agriculture, and all other land use practices do not cause significant deterioration of water quality or significantly disturb the region's surface waters and groundwaters;
- To minimize the creation of new impervious cover throughout the region to enable continued groundwater contribution to streamflow during low flow conditions, and to minimize flooding impacts from increased stormwater runoff. For example, the City of Colorado Springs has a Streamside Development Overlay Zone to regulate existing and new development along waterways. In addition, the Hillside Area Overlay Zone has specific conditions for development;
- To advise local governments in guiding future growth and development activities to areas where impacts on water quality will be minimized and/or controllable. El Paso County is working a county-wide Master Plan to replace their existing small area plans and bring the county current in their zoning regulations for existing and new development. This process is expected to take two years, 2019-2021;
- To enhance public knowledge of the importance of maintaining vegetative cover, and to develop policies such as streamside setbacks, which restrict certain types of development in order to protect and/or enhance water quality;
- To advise local governments where current and possibly future areas of high erosion, sedimentation, and degraded water quality exist; and

- To develop and recommend methods to stabilize streambeds and banks, protect against flooding (or against flood damages), and restore and maintain stream health.

The City of Colorado Springs and El Paso County have initiated various code updates and plan revisions but the overall regional coordination for development still needs encouragement. The only regional approach El Paso County initiated was the Water Master Plan (2018). More regional work needs to be done respective to stormwater.

4.3. Implementation Recommendations

The following implementation steps are recommended:

1. Local governments should adopt horizontal building setbacks from all stream channels, floodplains, wetlands, and other riparian areas. These setbacks should consider the following: soil permeability and erodibility (soil type); slope; cover conditions; intensity of adjacent land use; quality of existing riparian habitat; and threatened and endangered species.
2. Siting and construction of roads and highways should be done in a manner that considers and minimizes water quality impacts.
3. Modification of stream channel cross-sections and encroachment should be accomplished in a manner that prevents negative stream channel impacts upstream and downstream after modification.
4. Minimization and disconnection of impervious surfaces created by construction of parking lots, buildings, roads, vegetation, and soil removal and by other development activities are recommended to ensure groundwater recharge and to reduce the amount of runoff and pollutants. The greatest restrictions on impervious cover are recommended for groundwater recharge areas of regional importance and areas of high precipitation where groundwater recharge will have the highest contribution to groundwater supplies and surface water base flows.
5. Local governments should coordinate with the Colorado Parks and Wildlife (CPW) in the assessment of site-specific and cumulative impacts of

subdivision development on aquatic and wildlife habitats. These assessments should be used to minimize impacts to the aquatic environment and related habitats. Efforts to protect water quality provide additional benefits to wildlife, such as habitat protection.

6. Local governments should identify floodplains, geologic hazard areas, wildlife habitats, wetlands, riparian areas, and significant agricultural lands and should recommend areas in need of protection.
7. Identify and promote land use and development BMPs that mitigate negative impacts to water quality.
8. Preserve open space and agriculture with a coherent system of conservation easements.
9. Remove regulatory barriers and provide selective incentives for low-impact development, sustainable design, and green building to improve water quality and compliance with water quality standards.
10. Develop watershed-wide criteria, regulations, and policies as appropriate to each jurisdiction, to ensure water quality protection.
11. Work with counties and cities to determine potential water quality impacts and concerns of proposed projects.

4.4. Riparian and Wetland Areas

4.4.1. Policy Statement

Riparian areas and wetlands should be protected from degradation of water quality or activities that impair their function.

4.4.2. Purpose and Importance

The purpose of this policy is to promote the protection of wetlands and to recognize their importance in watershed health. Wetlands and riparian areas are critical to the support and diversity of many flora and fauna; they stabilize stream banks and act as a buffer strip to reduce stormwater runoff and reduce damage from erosion, sedimentation, and flooding. Properly located and designed wetlands can also help increase property values and tourism and can provide environmental education opportunities. Wetlands and riparian areas are

critical to consider in reducing water volume because they act as energy and water absorbers by spreading out and diffusing fast-flowing floodwaters, thus mitigating and minimizing the amount of damage. They act as natural filtration devices to trap harmful water quality pollutants and sediments, and they improve water quality.

There are four different categories of wetlands present throughout the watersheds in the three-county Region—peatlands, marshes, wet meadows, and riparian.

4.4.3. Summary of Regulations and Policies

Section 404 of the CWA regulates the discharge or placement of dredged or fill material into waters and wetlands of the United States. Activities that may be regulated under Section 404 include infrastructure development, draining or filling of wetlands, channel and waterway modification, maintenance and repairs, and construction of dams or levees for water resource development. The program is administered by the U.S Army Corps of Engineers (ACOE) with review by other federal agencies.

Pursuant to Section 404(e) of the CWA, the ACOE has the authority to issue general permits on a nationwide basis for any category of activity involving discharges of dredged or fill material if the activities in that category are similar in nature and have minimal adverse environmental effects, individually or cumulatively. Nationwide permits (NWPs) are a type of general permit issued by the ACOE and are designed to authorize, with little or no delay or paperwork, certain activities having minimal individual or cumulative adverse effects on the environment (see 33 CFR Section 330.1 for policies concerning NWPs).

There are several other federal statutes that may be applicable to wetlands and wetlands creation. These include the federal CWA, National Environmental Policy Act, Endangered Species Act, and wetland banking programs. Related state statutes that may apply include Colorado groundwater law and potential water rights issues.

4.5. Objectives

The objectives of the policy are to:

1. Provide a coordinated regional approach regarding the review of 401 and 404 permits for filling or otherwise altering wetlands.
2. Compare information with existing plans and information concerning high riparian and wetland habitats.

3. Activities occurring in designated areas should be reviewed and coordinated with other agencies.
4. Prepare and release a comprehensive inventory and assessment of all wetland and riparian areas in each of the watersheds contained in the three-county region.

Develop a pilot project using an existing wetland to demonstrate the ability of wetlands to filter pollutants.

4.6. Implementation Recommendations

The following implementation steps are recommended:

1. Critical stream environment zones, floodplains, wetlands, and riparian areas should be protected through zoning or acquired through conservation easements, land exchanges, transfer of development rights, or similar resource protection techniques.
2. Wetlands disturbance should be minimized. If disturbance is unavoidable, mitigation measures, such as preventing direct runoff, detention or infiltration of site runoff, and construction of new wetlands or enhancement of existing “poor quality” wetlands should be employed to achieve no net loss of wetlands.
3. Plans for public or private infrastructure and investments should avoid floodplains, wetlands, riparian areas, steep erodible slopes, and geologic hazard areas to the maximum extent practicable (MEP).
4. Section 401 and 404 permits should be reviewed for consistency with local comprehensive and watershed plans to determine potential impacts to streams, critical riparian and wetland areas; and the potential to cause erosion and sedimentation problems.
5. Develop and distribute a plan for each watershed that includes prioritized opportunities for protecting, enhancing, and creating new riparian and wetlands areas along with their associated functions.
6. Inventory existing wetland and riparian areas, and evaluate their conditions

and functionality, and list their desired future conditions and functionality.

7. Encourage development of projects that use reclaimed water to restore or enhance riparian vegetation.

4.7. Source Water Protection for Public Water Supplies

4.7.1. Policy Statement

The surface and groundwaters of the region shall be protected from potential threats, such as pesticides, fertilizers, road de-icing, and other contaminants to ensure water supply sources are not contaminated.

4.7.2. Purpose and Importance

This policy is to promote protection and prevent possible future impairments caused by improper use and over-application of chemicals and the improper locating of septic systems. These problems can cause high nutrient levels in the groundwater, degrade surface water quality, and cause exceedances of water quality standards so drinking water is unsafe. Management of these activities must be addressed at many levels and involves cooperation between local governments; landowners; and domestic, municipal, and industrial water and wastewater treatment plants.

4.7.3. Summary of Regulations and Policies

CDPHE has completed a source water assessment for all special districts that are drinking water providers in Colorado. The reports for all the districts are listed by county (El Paso, Teller, and Park counties) and are available at:

<https://drive.google.com/file/d/1jMHmA8l4CX1cm8oeSQpAi5tEHuC7bu1/view>

The purpose of these reports is to assess potential susceptibility of each public drinking water source to contamination and to develop recommendations for protective actions that can be taken to protect these sources. No statutory authority has been given to CDPHE to force the adoption or implementation of source water protection measures. Implementation authority will remain the responsibility of local governments.

Regulations and policies that influence source water protection include activities related to stormwater, OWTS and agriculture (e.g., fertilizer use, livestock management, pest management, and irrigation).

Other source water protection concerns are improperly maintained and functioning septic systems that can have source water and drinking water implications. Each county health department has OWTS regulations that discuss the setback requirements and other information pertaining to OWTS. The OWTS setbacks from wells range from 100 to 300 feet. Some counties are in the process of conducting studies to determine potential water quality implications from improperly maintained septic systems.

4.8. Objectives

The objectives of the policy are to:

- Encourage the appropriate amount, scheduling, and application of pesticide, fertilizer, and road de-icing and friction applications to protect the region's water quality.
- Encourage proper storage, transportation, and handling, both during normal and emergency operations, of pesticides, fertilizers, road sanding materials, and hazardous chemicals used in the region.
- Provide ongoing education and maintenance regarding septic systems and adherence to county OWTS regulations regarding appropriate setbacks for septic system installation.

4.9. Implementation Recommendations

The following implementation steps are recommended:

- Education efforts should be encouraged in cooperation with the Natural Resources Conservation Service and State Extension Service to inform the public and other users of fertilizers and pesticides concerning the appropriate use, and alternatives to the use, of these materials.
- Application of road de-icing and friction materials should be conducted throughout the region in accordance with the following recommendations:
- Sanding materials and chemical application rates should be the minimum necessary to obtain safe and efficient operation of streets, roads, and highways. Sanding materials should be removed as soon as

possible to prevent pollution of both watersheds and airsheds and applied only when snow and ice cannot be removed by blading, plowing, or when mitigated by sanding.

- Measures should be taken to minimize and mitigate the use of sand and chemicals especially in and adjacent to environmentally sensitive areas including streams, lakes, ponds, wetlands, aquifer recharge areas, and flood-prone areas.
- Local governments should enact regulations to require public storage and handling of hazardous materials be conducted in accordance with the following general guidelines:
 - All materials should be kept in appropriate containers and/or under cover, well protected from precipitation and stormwater flows.
 - All storage areas should be kept clean of spilled material.
 - Handling and moving of materials should be limited as much as possible.
 - Hazardous materials should not be stored on potential aquifer recharge areas, unstable slopes, flood-prone areas, and other geologic hazard areas.
 - Storage, handling, and transporting of large amounts of hazardous materials should be tracked and monitored throughout the region by the local fire departments or designated emergency response providers.
 - Entities that depend on ground and surface waters for domestic water supplies should develop appropriate protection programs, such as a wellhead or surface water protection program, pursuant to Section 1428 of the Safe Drinking Water Act.
 - Municipalities should evaluate the need to develop a watershed ordinance to protect water supply sources.
 - The communities and solid waste disposal facilities in the region

should encourage responsible disposal of household hazardous wastes (oil, paint, acids, pesticides, etc.), waste minimization, and source reduction programs, through public education and outreach.

4.10. Stormwater and Urban Runoff

4.10.1. Policy Statement

Minimize water quality degradation caused by stormwater and urban runoff and provide technical assistance to local governments to fulfill NPDES stormwater permit requirements.

4.10.2. Purpose and Importance

The effective management of stormwater and urban runoff is critical due to their potential to affect stream water quality, riparian zone habitat and wetlands, flood conveyance capacity, and sediment loading and transport. Hydrologic impacts from urbanization can cause water quality problems, aggregation/ degradation of stream channels, increased temperature, and sedimentation, which can have a corresponding effect on aquatic habitat, groundwater recharge and streamflow.

NPDES Stormwater Program Phase I and II practices are discussed in more detail in the nonpoint source section of each watershed. The 208 Plan supports the ongoing efforts by cities and counties in maintenance of their NPDES permits. A list of cities and counties required to have NPDES permits is shown below:

4.11. Table: Cities and Counties required to have NPDES Permits

NPDES Permit	Chico Creek Watershed	Fountain Creek Watershed	Upper Arkansas Watershed	South Platte/Upper South Platte Watershed
Phase I	None	City of Colorado Springs	None	None
Phase II	None	El Paso County, Manitou Springs, Fountain, Monument, Fort Carson, USAF Academy, City and County of Pueblo ¹	None	None

¹The City and County of Pueblo are not within the PPACG Planning Area

4.11.1. Summary of Policies and Regulations

Although not all communities have specific criteria regarding detention, its importance is mentioned in their planning policies. There are no specific federal or state laws or regulations mandating stormwater detention. However, state statutes require counties to adopt subdivision regulations requiring developers to submit maps and plans (where applicable) for facilities to control stormwater more than historic runoff levels.

Counties are also required by state statute to include provisions governing standards and technical procedures applicable to storm drainage systems and detention facilities in their subdivision regulations. Similar requirements do not extend to municipalities.

All governments require an erosion control plan that outlines methods for reducing soil erosion during construction and grading of land. All governments have some policy addressing erosion control, but the level of requirements varies across the watershed.

General requirements include an erosion control plan to be approved prior to the commencement of construction. More specific policies address requirements for temporary and permanent sediment control facilities, protection of land cover for long construction periods, and security required until construction is completed and inspected.

Industrial facilities, including most manufacturers, mining, transportation facilities, power plants, landfills, wastewater treatment plants, and recyclers that discharge water, must be covered by a state stormwater discharge permit.

Within the region, some counties and cities have developed a stormwater utility or enterprise to meet the need of improving the quality of streams and creeks and prevent flooding. Most of the stormwater utilities and enterprises require residents to pay a tax or fee based on the amount of impervious surface area. While no state or federal laws or regulations mandate the establishment of stormwater utilities, several state statutes do grant the authority to establish local improvement districts and give direction to local governments seeking to create stormwater utilities.

In some municipalities and counties, the costs are offset for the developer only if regional facilities are constructed as part of the development. Jurisdictional drainage planning for new development is authorized under CRS, pertaining to county and municipal planning and zoning.

4.12. Objectives

The objectives of the policy are:

- To promote water quality as an important consideration in making decisions on the location and extent of areas to be served by public and private facilities and services.
- To maintain and improve existing structural controls and encourage the use of nonstructural controls such as stormwater quality control planning, landscaping and vegetative practices, and general education programs in managing stormwater.
- Adoption of stormwater management policies based on sound engineering principles.
- Use Low Impact Development (LID) techniques to reduce peak flows and runoff volume to stabilize channel forming flows.

4.12.1. Implementation Recommendations

For areas not covered under a current NPDES permit, the 208 Plan recommends the implementation of the following strategies to ensure consistency with the stormwater and urban runoff policy statement:

- Stormwater detention, retention ponds, or other BMPs should be required to minimize flooding, maximize infiltration, and minimize water quality impacts from impervious surface contaminants. Common structural BMPs used are: stormwater detention and retention ponds, methods to minimize directly connected impervious surface areas, and irrigated grass buffer strips. Common nonstructural BMPs used are: stormwater quality-control planning, adoption of criteria and standards, illicit discharge controls, and general education programs.
- Direct discharge of stormwater to a lake, stream, or drainage way should be minimized.
- Erosion and sedimentation control plans should be required for areas

of one acre or larger and should show proper measures for controlling erosion and reducing sedimentation. These plans, when required, should be completed prior to the start of any work and include all proposed excavation, filling, and grade work for improvements.

- Where the potential for water quality impacts exist, the following requirements should be applied to any land use activity (some of these practices are currently being applied or partially applied by some of the cities and counties in the region).
- Disturbance management and revegetation plans should be developed when necessary and should include details of vegetation disturbance (schedule, area involved, equipment to be used, etc.) and a description of all measures to be taken during and following disturbance to minimize water quality impacts, including monitoring to determine effectiveness of the measures taken.
- Timing of disturbance: whenever possible, disturbances should be planned to occur at those times of the year when water quality impacts will be minimized. For example, disturbances immediately prior to or during the winter season may require more mitigation before the site can be revegetated.
- Area controls: consideration should be given to limiting the area of disturbance which occurs at any one time, particularly in locations where water quality impacts may be severe, such as on moderate to steep slopes having soils with low permeability.
- Equipment: methods for vegetation disturbance should be selected to minimize water quality impacts.
- Stabilization during disturbance: soil erosion controls and protection of surface waters should occur promptly after vegetation disturbance.
- Monitoring during disturbance: regular inspections should be made of a disturbed site to ensure the operation is in conformance with

grading and erosion control and that water quality impacts are being controlled to the maximum extent practicable.

- Post-disturbance monitoring: inspections of the disturbed site after completion of the operation are necessary to ensure measures to control water quality impacts are effective and to determine if remedial actions are required.
- Financial assurances should be secured to ensure erosion control plans, including prompt and successful revegetation of disturbed areas, are implemented.
- Building restrictions on slopes greater than 30% should be considered as a means of limiting the water quality impacts of soil disturbance (e.g., Colorado Springs Hillside Area Overlay Zone).

4.13. Agriculture and Silviculture

4.13.1. Policy Statement

Agriculture and silviculture activities should prevent degradation of water quality and ensure the long-term viability and natural succession of the system.

4.13.2. Purpose and Importance

Agriculture and silviculture include the cultivation of cropland (including grains, vegetables, and orchards), raising of livestock, and harvesting of forest products. The primary pollutant issues from agriculture are related to sediment, salinity, and fertilizers. Over-application of fertilizers to cropland may lead to increased nitrate levels in groundwater and nutrient-enriched surface runoff.

Silviculture plays an important role in ecosystem health by maintaining the number of trees, thus reducing the severity of forest fires. This is especially important in areas that are in and border Forest Service and Bureau of Land Management land where fuels reduction activities are critical.

4.13.3. Objectives

The objectives of the policy are to:

- Encourage the minimization of agricultural pollutants entering streams.

- Recognize and protect irrigated agriculture as an important groundwater recharge mechanism for sustaining stream flows during critical low-flow periods.
- Recognize forest management practices that minimize fire fuel buildup and control wildfires, diseases, and insect infestations as a viable long-term water quality management strategy.
- Ensure compatibility of investment policies for public facilities with other environmental protection programs (e.g., floodplain protection).

4.13.4. Implementation Recommendations

The following implementation steps are recommended:

- Forests should be thinned and maintained to prevent and reduce the severity of forest fires in the future.

BMPs for agricultural activities are recommended to minimize water quality impacts from these activities. These are discussed in the Colorado Nonpoint Source Program 2012 Management Plan:

<https://www.colorado.gov/pacific/cdphe/2012-nonpoint-source-management-plan>

Another good resource for agriculture groundwater protection programs is the “Agricultural Chemicals and Groundwater Protection Program,” which is a joint program involving the Colorado Department of Agriculture, Colorado State University Extension, and CDPHE:

<https://www.colorado.gov/pacific/agconservation/groundwaterprotection>

4.14. Wastewater Treatment Facilities

4.14.1. Policy Statement

Decisions to locate wastewater treatment systems, interceptors, and lift stations will be made in a manner that protects water quality and recognizes the protection of floodplains, geologic hazard areas, wildlife habitats, wetlands, and agricultural land.

4.14.2. Purpose and Importance

The purpose of this policy is to ensure public facilities are located and constructed with consideration for minimizing water quality impacts, while recognizing financial limitations. The communities of the region are extremely supportive of protecting water quality through the funding of well-constructed, -operated, -and maintained water and wastewater treatment facilities. Careful planning of public infrastructure is needed to assure maximum public benefit is attained with available funds.

PPACG supports necessary public wastewater treatment infrastructure needs as stated in the 208 Plan and supports implementation and funding of public wastewater collection and treatment needs as identified in the point source sections of each of the watersheds. PPACG will assist the designated management agencies with any technical assistance necessary.

If it is economically feasible, wastewater service will be provided in regional and sub-regional publicly owned wastewater treatment facilities, and smaller privately-owned facilities will be avoided. The potential negative impacts from smaller wastewater treatment facilities are:

- Reliability;
- Disposal of industrial wastes and sludge; and
- Potential cost of technology required to meet stream standards.

4.14.3. Summary of Regulations and Policies

Federal and state regulatory requirements have strengthened compliance of wastewater discharge facilities. The goal of the 1972 legislation of the CWA was the “restoration and maintenance of the chemical, physical and biological integrity of the Nation’s waters.” This act established regulatory requirements for wastewater dischargers that are amended and updated. Control strategies are required to achieve these standards if they are not being met. Specific numeric standards are established by CDPHE based on the water quality classifications and standards of the creeks the facilities discharge to.

The review of site applications must conform to and be consistent with PPACG’s 208 Plan and CDPHE WQCC Regulation #22, Site Location and Design Approval Regulations for Domestic Wastewater Treatment Works. Two documents used in the review of site applications are:

- CDPHE WQCD WPC-SA, Guidance Document for the Site Location and Design Approval Regulations for Domestic Wastewater Treatment Works; and

- CDPHE WQCD Policy WPC-DR-1, State of Colorado Design Criteria for Domestic Wastewater Treatment Works.

These documents can be found at:

<https://www.colorado.gov/pacific/cdphe/wq-guidance>

<https://www.colorado.gov/pacific/cdphe/wq-design-criteria-potable-water-systems-policies>

The health departments of El Paso, Teller, and Park counties each have OWTS regulations that are applicable for septic systems that are 2000 gallons per day or greater. The CDPHE WQCC has On-site Wastewater Treatment System Regulation, Regulation #43, which was updated in 2018:

<https://www.colorado.gov/pacific/cdphe/water-quality-control-commission-regulations>

4.15. Objectives

The objectives of the policy are to:

- Ensure adequate treatment facilities to collect, treat, and dispose of anticipated types and quantities of wastewater;
- Ensure the discharge of any water pollutants from wastewater treatment facilities, industrial or commercial processing activities, or mine waste tailings ponds meets the assigned conditions of its discharge permit so as to comply with stream standards as established by the Colorado Water Quality Control Commission;
- Ensure issuance of new permits and modified permits are consistent with the information contained in the 208 Plan;
- Support and encourage local governments and water providers to implement strategies and promote programs that encourage increasing the use of non-potable water, including the reuse of properly treated wastewater, increasing wise use of water, and requiring long-term water conservation efforts;
- Ensure development of solid waste disposal sites, including residuals from wastewater treatment, is conducted in accordance with sound

conservation practices, giving consideration to potential pollution problems inherent in proposed sites;

- Ensure the waste load allocations for point source discharges are met throughout the region through upgrading of existing treatment facilities and planning and construction of new facilities as required;
- Recommend regional cooperation, when deemed cost-effective and when practical alternatives exist, to avoid the proliferation of individual wastewater treatment facilities and/or wastewater treatment agencies;
- Ensure wastewater treatment facilities are properly operated and maintained by a certified and responsible operating entity.

4.15.1. Implementation Recommendations

The following implementation steps are recommended:

- All site applications for the region, prior to being submitted to CDPHE, will include a coordinated review by the Water Quality Management Committee, PPACG staff, and appropriate management agencies within the watershed. The site application will be reviewed against the 208 Plan, CDPHE WQCC Regulation #22, and other appropriate local and state regulations and policies.
- PPACG staff will review proposed changes to applicable CDPHE water quality standards, regulations, or policies affecting the review of site applications and discharge permits.
- OWTS greater than 2,000 gallons per day should connect to a designated management agency's wastewater system if it is economically and technically feasible. OWTS systems of less than 2,000 gallons per day that serve homes or small businesses should be encouraged to connect to a designated agency's system when it becomes accessible and continue to be reviewed by the local county health department where it will be constructed.

- Lift stations must provide enough emergency storage capacity at peak flow for the specific entity to respond to an emergency, and either fix the problem or remove the wastewater through trucks.
- Municipalities, counties, utilities, and other water providers should promote local water conservation and use of non-potable water by supporting appropriate educational efforts and ordinances. Support further research to determine strategies found to be effective in other cities and counties.
- Where site conditions require wastewater collection and central treatment, efforts should be made to consolidate treatment plants. Consideration, however, needs to be given to protection of instream flows, wastewater reuse opportunities, and water rights obligations. Every effort should be made to consolidate management agencies and special district boundaries where possible and financially feasible. At a minimum, proper long-term operation and maintenance should be provided by a responsible operating entity.
- Full compliance with the Colorado Operator Certification Act should be required. The state should emphasize the legal responsibility of the plant owner and should support the plant operator with timely repairs and reimbursement for operations. The state should promptly begin enforcement actions for chronic poor operation of treatment facilities.
- Biosolids generated by municipal and industrial wastewater treatment plants should be managed in accordance with applicable state or federal permits and Certificates of Designation.
- Encourage the reuse of biosolids as a primary application on crop and pastureland, land reclamation sites, nurseries, commercial landscapes, and re-use of treatment plant effluent. Efforts to beneficially use biosolids should be supported by local governments where financially feasible.

4.16. Onsite Wastewater Treatment System (OWTS)

4.16.1. Policy Statement

OWTS should be located in a manner that protects groundwater and surface water quality and recognizes geological constraints; and should be properly operated and maintained.

4.16.2. Summary of Regulations and Policies

The CDPHE WQCD regulates the discharge of wastewater from all septic systems with design capacities greater than 2,000 gpd. PPACG is also required to review the site applications for these systems and make recommendations to CDPHE prior to their review. The health departments of El Paso, Teller, and Park counties each have OWTS regulations that are applicable for septic systems of less than 2,000 gpd and are required to be approved by the local health department. These regulations are adopted pursuant to the Colorado On-site Wastewater Treatment Systems Act, updated in 2012, and the CDPHE WQCC On-site Wastewater Treatment System Regulation, Regulation #43, updated in 2018. This Colorado statute and CDPHE WQCC regulation are found at:

<https://www.colorado.gov/pacific/cdphe/wqcc-regulations-and-policies-and-water-quality-statutes>

The CDPHE WQCD website regarding OWTS is:

<https://www.colorado.gov/pacific/cdphe/clean-water-site-wastewater-treatment-systems>

4.16.3. Objectives

The objectives of this policy are to:

- Ensure proper operation and maintenance of onsite wastewater treatment systems;
- Ensure systems are installed by a certified installer; and
- Ensure surface water and groundwater quality are being protected.

4.16.4. Implementation Recommendations

The following implementation steps are recommended:

- Make certain all site applications for wastewater systems that are over 2,000 gallons per day are reviewed and are consistent with applicable

county and state OWTS regulations;

- Require an analysis of costs associated with hookup to a central wastewater treatment facility;
- Ensure the system will be properly operated and maintained and will not exceed the maximum treatment capacity if future growth is planned;
- Require thorough state, regional, and local reviews of all proposed subsurface disposal systems. These systems are a growing problem in the region, and with reduced federal funding for centralized facilities, these OWTSs are likely to see increased use.
- Make sure location, depth, installation, operation and maintenance of systems and other information is put into a central database tracking system.

Teller County, due to its alpine setting and unique geologic setting, presents several problematic issues with regard to Onsite Wastewater Systems. These problems are the result of very low temperatures experienced in winter, deeper levels of ground freezing, rapidly draining soils, and low-level permeability bedrock (TST, 2001).

Teller County has existing regulations governing the lot sizes suitable for installation and use of OWTS and individual wells. This is addressed in the 200-foot setback requirement between a well and an OWTS system. These setbacks also have an effect on the minimum lot size. TST (2001) concluded that continued reliance on onsite wastewater treatment systems barring future technological changes that significantly advance the effectiveness and the ease of use for such systems, will result in continued degradation of water quality. The remediation of groundwater already contaminated by OWTS operations will be extremely difficult and expensive to accomplish. The type of contamination and the rate of degradation are usually controlled by the lot sizing and the density of the subdivision.

Several subdivisions in Teller County (Forest Glen, Navajo Mountain Mesa, and Highland Lakes) have reported high nitrate levels in the groundwater, and this may be caused by septic system contamination.

More information regarding the reports completed for Teller County regarding groundwater

supply and the effects of septic systems on water quality can be found under the Water Quality Analysis Section of the Upper Arkansas Watershed.

5. Population Projections

This section presents a summary of population projections for each of the three counties: El Paso, Teller, and Park. Each of the counties is divided into wastewater treatment areas according to the service areas of each listed treatment district or facility, with towns and cities identified if they are the wastewater service provider. Population projections were generated for the years 2020, 2025, 2030, 2035, 2040, and 2045.

The updated population projections for El Paso County were based on the adopted 2015 Small Area Forecast and were derived from a regional growth model that considered state demographer data, current land use patterns, historical growth trends in the region, and forecasts performed by the county and individual wastewater treatment providers. The projected population for each service area includes modeled population growth within the current boundaries of each treatment area, as well as assumed treatment area expansion according to historical trends for that district or treatment facility. For example, Woodmen Hills provides wastewater treatment for four neighboring metro districts, and their projected population assumes this arrangement continues as those neighboring areas are developed.

Population projections for Teller and Park counties were updated using state demographer data, with wastewater treatment populations maintained from the previous report, which were acquired directly from the wastewater district or based on: a) the number of taps multiplied by the number of Single Family Equivalents (SFEs), which range from 2.4 to 2.9; or b) the average hydraulic loading rate for the facility divided by a population equivalent (PE) of 80 to 120 gpd, depending on the district.

The state demographer data, available from the Colorado Department of Local Affairs (DOLA), are typically based on the most recent census and adjusted according to the latest economic data. Therefore, the DOLA population projections for each county do change over time. The most recent DOLA projections for each county are used in this report.

The implications of the population projections are discussed in each of the individual watershed sections. Anticipating future growth in the region reinforces the importance of understanding the correlation between growth and watershed health. Tables 5.1.1 through 5.3.1 list the population projections for the counties and the dischargers. The projections include forecasted populations outside the current or projected boundaries of an existing wastewater treatment area. These individuals must either be serviced through septic systems, be included in the formation of a new service district or be included in the service area

expansion of an existing wastewater treatment provider.

5.1. El Paso County

Table 5.1.1 shows the population projections for El Paso County. The large urban areas of El Paso County are located within the Fountain Creek Watershed. Included in these projections are services Colorado Springs Utilities will provide to areas outside of the city limits: City of Manitou Springs, Peterson Air Force Base, Garden Valley, and Stratmoor Hills.

Given the rapid growth of the unincorporated areas surrounding the City of Colorado Springs, Colorado Springs' share of the regional population is expected to drop from 69% to 61% by 2045. Fountain's population has grown an average of 7% per year since 2000, and that growth is expected to continue. Most of the city's commercial growth is at the northern end of the city.

5.1.1. Table: El Paso County Population Projects by District and/or Service Area

El Paso County WWT Provider	2020	2025	2030	2035	2040	2045
Academy Water & Sanitation	390	408	425	443	460	478
Air Force Academy	4,254	4,254	4,254	4,254	4,254	4,254
Cherokee Metropolitan District	24,054	25,183	26,313	27,442	28,572	29,701
Colorado Springs Utilities	476,120	505,574	535,028	564,481	593,935	623,389
Ellicott Springs Utilities	300	306	312	318	324	330
Fort Carson	10,292	10,292	10,292	10,292	10,292	10,292
Fountain RJC2 WWTF	7,519	8,407	9,295	10,182	11,070	11,958
Harold D. Thompson Regional WWTF	20,558	25,916	31,274	36,631	41,989	47,347
Meridian Ranch Metropolitan District	6,240	10,215	14,190	18,164	22,139	26,114
Schriever AFB	517	573	628	684	739	795
Security Sanitation District	20,448	21,152	21,857	22,561	23,266	23,970
Town of Calhan	1,117	1,396	1,674	1,953	2,231	2,510
Tri-Lakes WWTF	15,406	18,280	21,154	24,028	26,902	29,776
Upper Monument Creek Regional WWTF	13,714	14,925	16,136	17,347	18,558	19,769
Walden WWTF	1,082	1,096	1,110	1,125	1,139	1,153
Widefield Sanitation District	27,993	34,509	41,026	47,542	54,059	60,575
Woodmen Hills	12,167	14,419	16,671	18,924	21,176	23,428
District Totals:	642,171	696,905	751,638	806,372	861,105	915,839
Population Forecast Total:	697,701	762,849	827,998	893,146	958,295	1,023,443
DOLA Control Total:	735,176	794,078	855,206	914,438	971,042	1,024,159
Forecasted Population Not in a Treatment Area:	55,530	65,945	76,360	86,774	97,189	107,604

5.2. Teller County

Table 5.2.1 shows Teller County population projections. Teller County is within two drainage basins, the South Platte River Basin and the Arkansas River Basin. The fastest growing area of Teller County is projected to be the unincorporated portion of the county, which is largely serviced through septic systems.

5.2.1. Table: Teller County Population Projects by District and/or Service Area

Teller County WWT Provider	2020	2025	2030	2035	2040	2045
Florissant Water & Sanitation District	832	838	847	848	851	855
City of Woodland Park	8,859	9,032	9,211	9,324	9,409	9,495
Teller County Wastewater Utility	652	655	662	669	674	681
City of Cripple Creek	1,419	1,438	1,460	1,470	1,484	1,498
City of Victor	641	653	667	682	690	700
District Totals:	12,403	12,616	12,847	12,993	13,108	13,229
DOLA Control Total:	25,630	27,586	28,548	29,287	29,880	30,424
Population Not in a Treatment Area:	13,227	14,970	15,701	16,294	16,772	17,195

5.3. Park County

Table 5.3.1 shows Park County population projections. The greatest anticipated source of growth in Park County is in the residential market. The Bailey area leads the county in proposed development, but the Alma and Fairplay areas are increasing in popularity for full-time residents (commuters and retirees). Additionally, the South Park area is becoming a popular location of residential choice.

Table 5.3.1 shows currently about 95% of Park County residents live in unincorporated (outside of Alma or Fairplay) portions of the county. Unincorporated communities with the most growth include Bailey, Shawnee, and Pine Junction. According to Park County's Strategic Master Plan, high-density development will only be allowed in rural areas; the five areas identified are Grant, Shawnee, Bailey, Crow Hill, and Pine Junction.

5.3.1. Table: Park County Population Projections by District and/or Service Area

Park County WWT Provider	2020	2025	2030	2035	2040	2045
Town of Alma*	307	316	326	335	345	356
Fairplay Sanitation District*	756	779	802	826	851	876
Bailey Water & Sanitation District *	8,435	8,688	8,948	9,217	9,493	9,778
Will-O-Wisp Metro District	<i>No Population Data</i>					
District Totals:	9,498	9,783	10,076	10,378	10,690	11,010
DOLA Control Total:	18,642	19,869	21,229	22,272	22,627	22,401
Population Not in a Treatment Area:	9,144	10,086	11,153	11,894	11,937	11,391

5.4. Conclusions

The DOLA projected populations for the three counties are expected to increase, but at a decreasing rate to the year 2045. El Paso, Teller, and Park counties are projected to grow at approximately 8%, 7.6%, and 6.6%, respectively, over the next 5 years until 2025. The growth rates then taper off to 5.5%, 1.8%, and -1% from 2040 to 2045 for each county. Most population growth in El Paso County will still take place in incorporated areas, while growth in Park and Teller counties is primarily taking place in unincorporated areas. The current and proposed wastewater treatment facilities discussed under the Future Needs Assessment for each watershed are expected to be sufficient to service population projections through the year 2045. El Paso, Park, and Teller counties, as well as their respective municipalities, are growing more rapidly than most other areas of Colorado and the United States. The impacts of this considerable growth will be evident in the increasing demand on resources and utilities.

5.5. Overview

Federal and state law requires implementation of the recommendations made in this Plan consider environmental, social, and economic impacts. In minimizing potential impacts, the following criteria are considered:

- Meet the needs of the current residents without compromising the quality of life in future generations.
- Maintain economic growth while maintaining or improving water quality, producing less waste, and extending opportunities to live in a

pleasant and healthy environment.

- Meet human needs by maintaining a balance between development, social equality, ecology, and economics.

Implementation of the recommendations requires taking a larger regional perspective, looking at past trends and current activities, and considering how future activities might affect the region. By looking at projects on a watershed scale, it is easier to determine the direct, indirect, and cumulative impacts of existing and proposed projects. This plan recognizes the recommendations to mitigate and prevent future problems have both positive and unintended negative effects.

Environmental, social, and economic impacts are usually not considered in developing standards but are considered in implementation of standards and discharge permit requirements. It is critical to recognize the intended and unintended consequences of recommendations during planning and prior to implementation because it could influence project design and potential mitigation actions. An assessment of future needs should consider potential economic, social, and environmental implications for compliance with new water quality standards.

5.6. Environmental Impacts

The overall intent of this plan is to maintain and improve the existing quality of the watershed's streams and lakes while accommodating growth and development.

Improvement in water quality is critical in degraded stream segments, which are unable to support the full range of potential uses. Each of the plan's recommendations is aimed towards these objectives, which are consistent with the goal of Section 208 of the federal CWA. Environmental impacts may occur upon implementation of the plan either as a result of adoption of the recommended controls on new potential sources of water quality degradation (preventative strategies) or as a result of recommended cleanup activities.

5.6.1. Impact Discussion

Recommendations target the unique problems identified in each of the five watersheds. Implementation of the recommendations will require either: a) greater enforcement of existing regulations, b) development of new regulations, or c) changes to existing regulations. Potential *negative impacts* due to modifications to existing wastewater treatment facilities that would be necessary to meet future standards include:

- increased energy consumption;
- land use impacts;
- increased cost; and
- short-term impacts from noise, dust, soil disturbance, and traffic due to construction.

Positive impacts include:

- improvement and maintenance of water quality in streams;
- protection and enhancement of aquatic life in fishery resources;
- maintaining plant species and composition;
- reestablishing and maintaining ecological processes across the landscape;
- protection of wetlands and riparian areas; and
- reestablishing hydrologic regimes and processes on a watershed scale.

In addition to point source controls, nonpoint source prevention strategies will continue to be implemented to meet the objectives of the CWA. These policies address water quality degradation, urban runoff, construction activities, agriculture activities, use of chemicals, fill in of wetlands, and degradation of riparian areas.

5.7. Social and Economic Impacts

This plan is intended to serve the population projected by local governments within each of the corresponding five watersheds.

5.7.1. Impact Discussion

Protection and enhancement of the environment is a key element towards economic diversification and the provision of a stable economic community for residents of the region. Many examples of the potential for economic diversification relate to the protection and enhancement of water quality, such as tourism and recreation.

Potential *negative impacts* of implementing the plan include:

- increased development costs associated with protecting water quality;
- and

- increased costs to customers through higher utility rates or increased taxes.

Positive impacts of implementing this plan include:

- expansion of recreational opportunities under a system more sensitive to diverse public needs, balanced with needs to conserve resources and protect the watershed;
- management of the watershed under the auspices of regional and multi- jurisdictional planning efforts that include participation from a broad range of stakeholders, resource managers, and public officials;
- maintaining and/or establishing viewsheds; and
- increased opportunities for local economic development.

5.8. Water Rights

The 208 Plan is not intended to address water resource issues but does recognize the challenges many districts and utilities face. A major impact many districts are facing is the ability to acquire new water, maximize existing water rights, and continue conservation efforts. In some areas this is accomplished through development of additional recharge systems, purchasing of additional wells, etc.

6. South Platte Headwaters and Upper South Platte Watersheds

6.1. Introduction and Overview

The South Platte River is comprised of four major drainages. The North, Middle, and South Forks of the South Platte River and Tarryall River, which flow through two watersheds— South Platte Headwaters and Upper South Platte Watersheds. The South and Middle Forks and Tarryall River are located in the South Platte Headwaters Watershed and the North Fork is located in the Upper South Platte Watershed.

The South Platte Headwaters Watershed is almost entirely within Park County, except for a small portion in the northwestern portion of Teller County; the Upper South Platte Watershed overlaps five counties—Park, Teller, Clear Creek, Jefferson, and Douglas. Teller County is unique because it has a natural drainage divide running east-west through the county: the southern portion is in the Arkansas River Basin and the northern portion is in the South Platte River Basin.

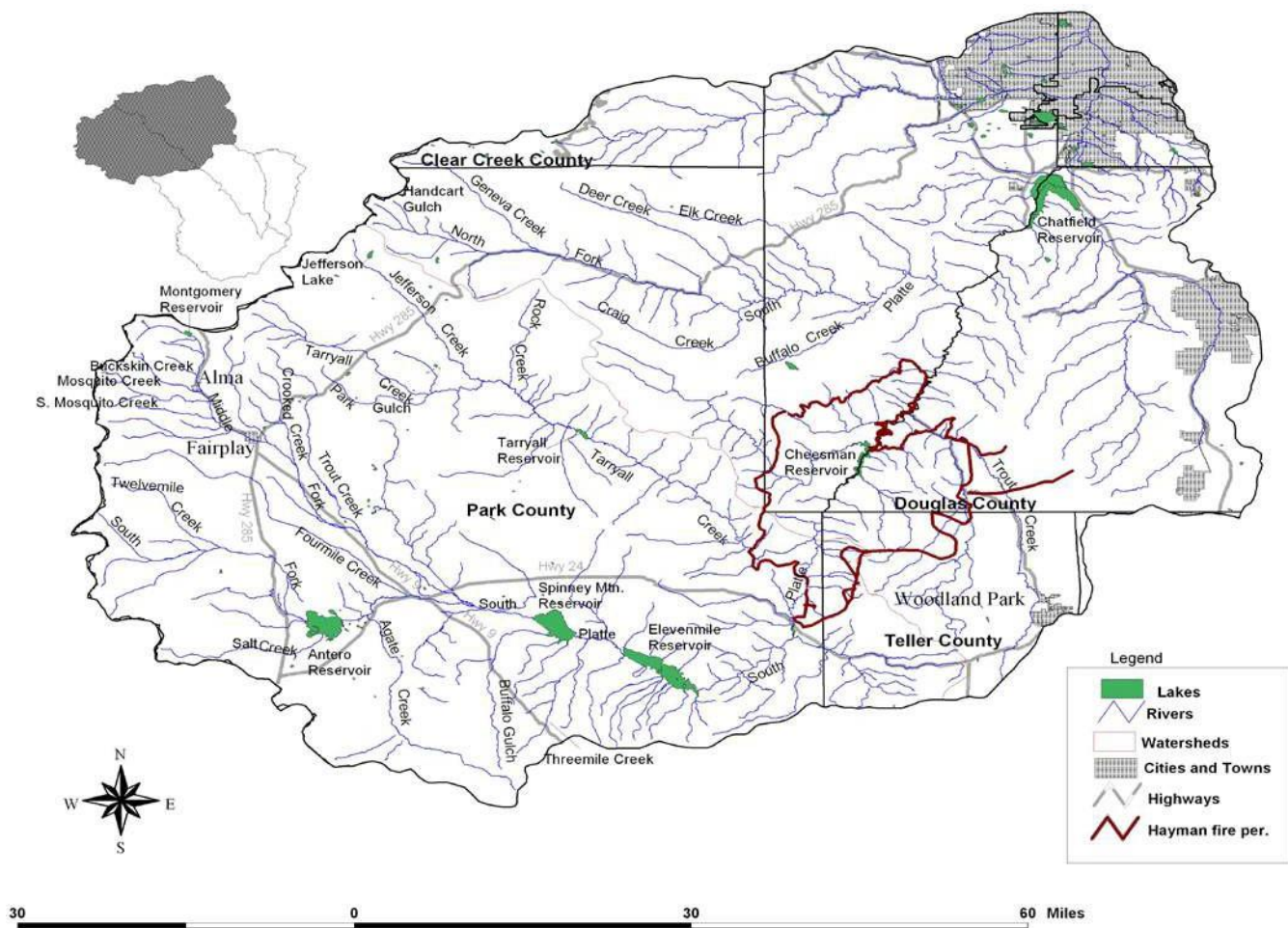
The portions of Park and Teller counties located within these watersheds are sparsely populated, with several small towns located near historic mining, recreation, and agricultural areas. The cities/towns of Woodland Park (located partially within the watershed), Fairplay, and Bailey are the largest in the watershed. The smaller communities include Lake George, Jefferson, Alma, Bailey, Divide, and Deckers. Many of the communities throughout the watershed have a mix of permanent and seasonal residences. Many homes are located adjacent to the river and its tributaries.

Mining and ranching played an important role in the early development in Park County. Diversions from the South Platte River provided water for mineral processing and irrigation of hay meadows. Dams and reservoirs constructed to provide water storage for Front Range municipalities also serve as fishing and recreation sites for Park County residents and visitors.

- Montgomery Reservoir above Alma is storage for Colorado Springs.
- Antero Reservoir and 11-Mile Reservoir along the South Platte are storage for Denver Water.
- Jefferson Lake and Spinney Mountain Reservoir provide storage for Aurora.
- Tarryall Reservoir is operated by the Colorado Parks and Wildlife and is used for fishing.

The Park County Strategic Master Plan was updated in 2016 and provides countywide goals & strategies to enhance future growth and development (RPI Consulting LLC, 2016). The Master Plan contains several strategies regarding Growth Management, Natural/Cultural Resources and Environmental Hazards, Open Lands and Agricultural Lands, and Infrastructure/Public Services, which will directly and indirectly affect water resource and quality issues in the future. Those goals & strategies are also given for each of the twelve (12) subareas: Bailey/Pine Junction/Crow Hill/Shawnee/Grant, Fairplay/Alma/Jefferson/Como, Hartsel, Lake George; and Guffey.

6.2. Figure: South Platte and Upper South Platte Watershed Reference Map



6.3. Land Use Description

Land ownership within the watershed is mostly public parcels. The U.S. Department of Agriculture (USDA) Forest Service is the largest landowner within the basin, owning 51% of the land. The Forest Service manages the Pike National Forest, which covers roughly a 1400-square-mile area of the watershed. National Forest Service lands are managed in accordance with the Land and Resource Management Plan for the Pike and San Isabel National Forests, and the Comanche and Cimarron National Grasslands approved in November 1984.

The second largest public landowner is the State of Colorado, managing approximately 155 square miles. The Bureau of Land Management (BLM) manages 98 square miles. Other significant public landowners include the National Park Service (Florissant Fossil Beds National Monument), Denver Water, and the City of Aurora. Private landholdings make up the remainder (41%) of the land ownership within the basin.

Mountain biking, camping, skiing, hiking, and fishing are the primary tourist activities in the area but snowmobiling and the use of off-road vehicles are growing rapidly. The number of people enjoying these activities is increasing yearly with Highway 285 becoming congested during the weekends. In addition to vehicular emissions, the heavy use of the county for tourism is adversely affecting the water quality through erosion from overuse of unsurfaced roads, backcountry trails, campgrounds, and reservoirs. South Park is recognized for its trout waters: over 50 miles of public streams are designated as Gold Medal trout water by the Colorado Parks and Wildlife. Several historic ranches were secured for limited public fly-fishing. There may come a time when permits will be needed to preserve some of these areas for everyone to use.

The Park County Land Use Regulations were updated in 2005, and additional revisions were made in 2008 and February 2009. The land use regulations were revised to make them easier to understand and to cut out redundant and useless sections. The regulations include governing water and wastewater, wildlife habitat, zoning, and subdivision use regulations. The regulations can be found at: <https://parkco.us/189/Land-Use-Regulations>.

The Land Use Regulations recognize and attempt to implement the goals, objectives, and policies of Park County as contained in the Park County Strategic Master Plan (Park County, 2016). This plan can be found at: <https://parkco.us/188/Strategic-Master-Plan>.

Conceptually, a master plan is a guide to develop, rather than an instrument to control, land

use; thus, the master plan is only one source of comprehensive planning and is by express state law and statute advisory only. Some important components of the plan include:

- Provide for protection of the public health, safety, welfare, comfort, convenience, and prosperity of the residents and the cultural environment.
- Provide for balanced, orderly growth patterns and efficient, phased government services to accommodate existing and future residents.
- Preserve and promote the value of property, protect the tax base of Park County, and respect the property rights of citizens.

6.4. Population and Socioeconomic Characteristics

According to the Census 2010, Park County had 16,262 residents. Population forecasting conducted by the Department of Local Affairs, available at <https://demography.dola.colorado.gov/population/data/profile-county/> showed:

- Because many portions of Park County consist of national forest and state-owned lands, significant growth will not occur in certain areas.
- The growth in the municipalities can be attributed to their proximity to metropolitan areas.
- The Alma/Fairplay area is expected to grow significantly over the long term because is an affordable place to live for employees of Summit County's resorts.
- Lake George has become an attractive place to live for retirees and the semi-retired, due to its lower elevation and milder climate.

6.5. Overview of Watershed Issues and Activities

The high-priority watershed issues **identified** include:

- Agriculture—where livestock grazing is a concern in the southwestern portion of the county and especially near riparian areas and streams. Cattle are being fenced out in certain areas to perform stream restoration projects.
- Erosion—prevalent throughout the watershed, but especially in the

east and southwestern portion and areas impacted by the Hayman wildfire.

- Mine discharges and runoff—many of the water quality problems are from historic mining activities. Examples of these are in Mosquito Creek, South Mosquito Creek, and Geneva Creek.
- Wildfires—Wildfires have caused severe damage in the watershed. Restoration efforts are still ongoing and are being coordinated by the Coalition of Upper South Platte (CUSP) with the U.S. Forest Service; local fire departments; Park, Jefferson, Teller and Douglas counties; and NRCS.
- Wetlands—Wetland conservation efforts are being concentrated on the South and Middle Forks of the South Platte River and the Tarryall River Corridor. Park County, Colorado Open Lands, The Nature Conservancy, and other agencies are working on acquiring conservation easements to help private landowners keep their natural and agriculture resources intact in the future.

6.6. Summary of Major Planning Efforts

Major planning efforts completed in the watershed include:

- Park County Strategic Master Plan (RPI Consulting LLC, 2016);
- Upper South Platte River Conservation Project;
- Revised Land Use Regulations (2016);
- USGS Water Resource Investigations Report 07-5220 (USGS, 2007);
- South Park Basin Legacy Project;
- Park County Inventory of Critical Biological Resources (CNHP, 2001);
- Town of Alma Source Water Protection Plan (CRWA, 2014)
- Source Water Protection Plan for the Upper South Platte River (Denver Water, 2015). Report can be found at <https://cusp.ws/reports>

- 2011 Ground and Surface Water Monitoring Project: Baseline Monitoring to Address Oil and Gas Development in South Park (CUSP, 2012)
- Geology and Groundwater Resources of Park County (Colorado Geologic Survey, 2017). Report can be found at <https://store.coloradogeologicalsurvey.org/product/geology-groundwater-resources-park-colorado>

7. Water Quality Characterization

Surface water and groundwater quality problems in the South Platte watersheds are due to historic water diversion, agricultural practices, mining activities in Park County, and unique geological formations containing natural heavy metals (i.e., iron, copper, manganese, zinc) and radium-rich minerals. Drinking-water source protection programs and TMDL studies largely affect water quality planning issues within this area.

7.1. Standards and Classification

Classifications and Numeric Standards for South Platte River Basin, Regulation #38, last updated in 2019, identifies the surface water segments and corresponding standards for the South Platte and Upper South Platte Watersheds. The stream segments within Regulation #38 are Upper South Platte Segments 1a, 1b, 2a, 2b, 2c, 3, 4, 5a, and 5b. Most of the proposed changes to these segments were updates based on changes adopted in the basic standards and revisions to the segment descriptions to separate lakes from the streams.

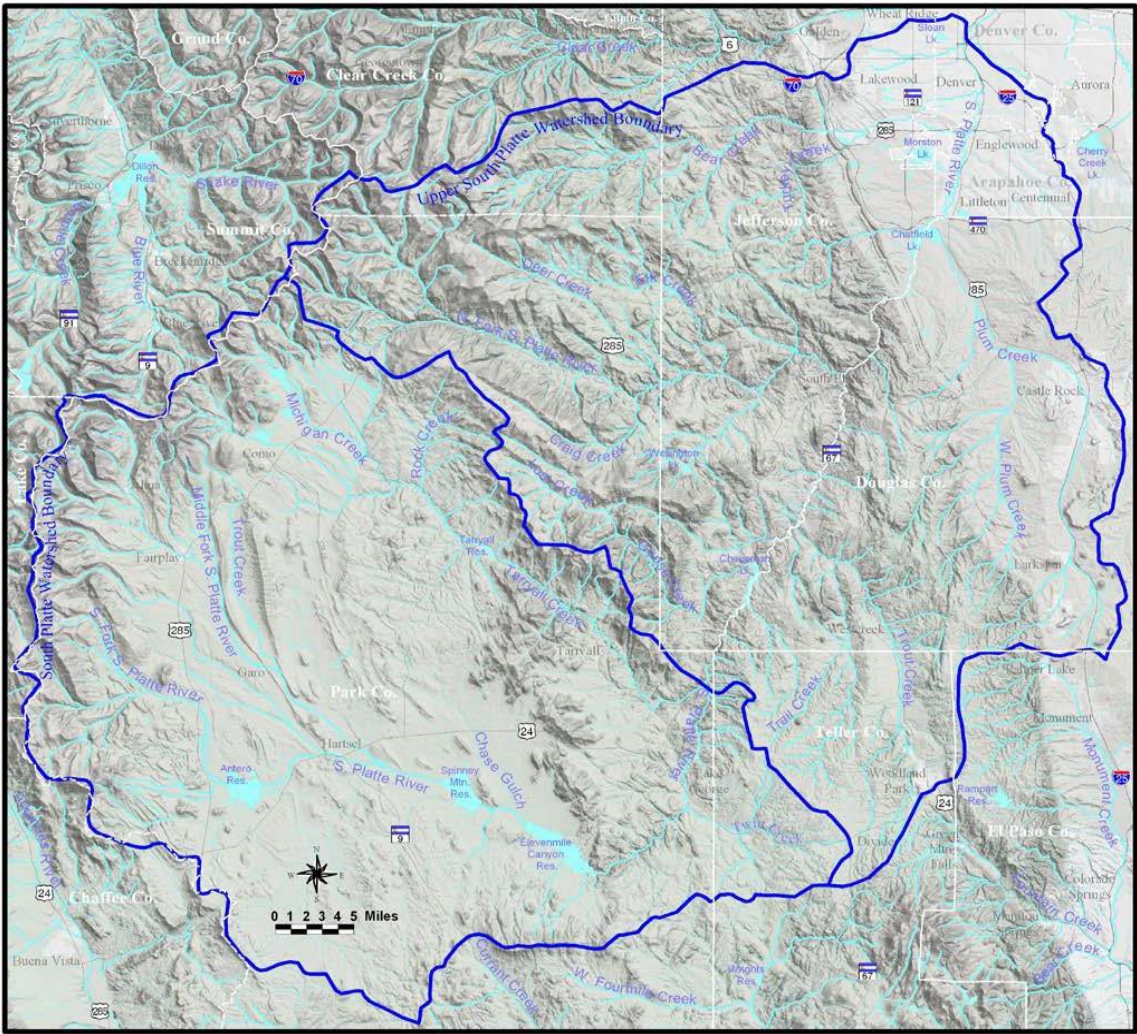
Issues that might affect the South Platte Basin as part of the next rulemaking hearing in 2020 are:

- More restrictive ammonia standards;
- More restrictive chloride standards;
- Revision of total recoverable arsenic standards;
- Temperature standards; and
- Nutrient standards.

7.2. Surface Water

Several municipalities depend on Park and Teller counties for their water supply. Residents in Teller and Park counties primarily depend on groundwater and not surface water as the primary component to the total water supply. Woodland Park and Alma, along with the smaller communities of Grant, Camp Alexander, Camp Santa Maria, Insmont, Glen Isle Lodge, Mooredale, Shawnee, and Eastbrook are the only entities that utilize surface water as a component of the total water supply. The cities of Denver, Aurora, and Colorado Springs also depend extensively on this for surface water. As growth continues along the Front Range, the evaluation of water supply alternatives in Park County will probably increase.

7.3. Figure: South Platte and Upper South Platte Stream Locations



7.4. Approved TMDLs

Table 3 in Appendix C is a list of TMDLs that are approved or are in progress in the PPACG portion of the Upper South Platte/South Platte Watersheds. Hyperlinks to the segment reports are included within the table, and all reports are listed at

<https://www.colorado.gov/pacific/cdphe/tmdl-south-platte-river-basin>

7.5. Water-Quality-Impaired Stream Segments

Most of the segments identified on the 2018 303(d) List and the Monitoring and Evaluation List are due to historic mining activities and sediment. While several segments have impairments for constituents that would not normally be associated with historic mining activities, primarily E. coli, other impairments (particularly those of metals such as arsenic, iron, and lead) are likely from historic mining operations or naturally occurring. Similarly, selenium is a water quality concern in many parts of the state and has been found to be naturally occurring.

7.6. Water Quality Analysis

There has been very little surface water quality data collected in Park County by the USGS or other agencies since the last update of the 208 Plan in 2010. The focus has been on the South Platte River in the Denver area and downstream from Denver. Groundwater quality data has been collected in Park County and is discussed in the groundwater quality section.

Results of the water quality assessment conducted as part of the previous 2010 208 Plan update indicate water quality is good except for localized problem areas that are primarily a result of historic mining activities and improper grazing activities. These problems were described in the Surface Water Stream Section. This water quality analysis will primarily examine the issues of most concern in Park County: nutrients; fires and post fire flooding; physical properties; and metals and other trace elements.

7.7. Nutrients

Stream segments are currently being evaluated for the potential development of stream standards for total phosphorous and total nitrogen. The CDPHE (2009) is analyzing discrete samples from several stream segments for total phosphorous and total nitrogen concentrations in preparation of determining nutrient standards.

Nitrogen and orthophosphate are the primary nutrient concerns in Park County. Elevated

nutrient levels which can degrade aquatic habitat, accelerate algae growth, and are toxic to fish (in the form of unionized ammonia) may be caused by sources such as wastewater discharges, seepage from septic systems, and fertilizers. Nitrate concentrations are typically higher in urban and built-up areas than in rangeland and forested areas. Nitrite was not detected and most unionized ammonia concentrations were less than the state chronic standard of 0.02 mg/l; all nitrate concentrations were less than the in-stream standard of 10 mg/l (USGS, 2001).

7.8. Fires and Post-Fire Flooding

Water quality impacts from forest fires include flooding, erosion, and an increase in the amount of bedload and suspended sediment that is transported. The amount of runoff and erosion rates depend on the intensity of the storms and the effectiveness of the rehabilitation practices taking place. The Forest Service is monitoring the implementation of the treatment processes that have taken place.

7.9. Physical Properties

Based on the 2018 update of the 208 Plan, no segments were impaired in subwatersheds for dissolved oxygen, thus indicating that dissolved oxygen concentrations were at acceptable levels. Similarly, no segments were impaired in subwatersheds for pH, indicating that pH concentrations were at acceptable levels.

7.10. Phosphorous Loading

Phosphorous loads in the South Platte River Basin are extremely important due to the limits placed on the Chatfield Reservoir from the South Platte River Basin.

7.11. Metals and Other Trace Elements

Based on data available during the 2010 update, some segments were impaired for dissolved selenium, total arsenic, dissolved manganese and total and dissolved iron. A summary of all 2018 303(d) listings in the Fountain Creek Watershed for water quality impairments and the monitoring and evaluation list can be found in Section 17.1.3. Metals such as aluminum, barium, iron, and manganese are abundant in the types of igneous and sedimentary rocks found in Park County.

Total iron and dissolved manganese were found to be the highest in areas where abandoned mines were present. In 2010, the Coalition for the Upper South Platte conducted a Mine Assessment Project. The assessment included fifty water quality samples on seventy-three sites. For example, at Hall Valley, primary metals were found exceeding state standards

including aluminum, cadmium, copper, manganese, lead and zinc. More information and field data can be found at <http://cusp.ws/wp-content/uploads/2014/10/CUSPmineReport2010Comp.pdf>

7.12. Suspended Sediment

In 2015, CUSP conducted a Roads to Rivers assessment of Eleven Mile Canyon, Happy Meadows, and Sportsmen's Paradise Roads which evaluates the road conditions, drainage systems, sediment concerns, traffic use, environmental conditions, and recreation management in the upper South Platte River corridor near Lake George, Colorado. Sources of suspended sediment was found from the road within Eleven Mile Canyon as the primary source, with an annual sediment yield of approximately 3.5 tons for the entire 8.7-mile length of Eleven Mile Canyon road. More information and field data can be found at <http://cusp.ws/wp-content/uploads/2016/02/2015.09.30%20Roads%20To%20Rivers%20Assessment%20-%20Eleven%20Mile%20-%20Happy%20Meadows%20-%20Sportsmens%20-%20Final.pdf>

7.13. Groundwater

7.13.1. Overview

Many streams and lakes in Colorado are sustained during dry periods by inflow from groundwater. During wetter periods, aquifers may be recharged from water in the same streams and lakes. It is this connection between surface water and groundwater that forms the understanding of the impacts one source might have on the other. There is increasing reliance on groundwater, especially during recent drought periods, for purposes where surface water is used, thus requiring more monitoring and control emphasis to now be directed toward its preservation. In many areas such as Bailey, residents have to drill deeper wells and are noticing water levels in the wells are much lower due to the decrease in aquifer recharge from below-average precipitation levels. This can also lead to increased concentrations of groundwater contamination because of less dilution. The specific water quality impacts due to the drought on residents who rely on groundwater wells still needs to be assessed.

Park and Teller counties share similar geologic characteristics and problems and rely heavily on groundwater as a source of drinking water for residents in both the incorporated and unincorporated areas. Alma and Woodland Park are two major cities/towns that utilize a surface water collection system and groundwater pumping to meet their drinking water needs. This is of particular concern since an increase in population in both Park and Teller counties will cause an increase in the amount of groundwater withdrawals.

7.13.2. Groundwater Monitoring

Park County is seeing an increased demand on water resources, as well as increased groundwater contamination due to the forecasted upward trend in population. The Phase I monitoring effort was completed by a cooperative effort between USGS, Park County, and Center of Colorado Water Conservation District. This effort indicated:

- Limited groundwater-quality data suggests groundwater contamination may be occurring in some aquifers and may be associated with population growth and increased on-site wastewater systems; and
- Broad-scale geographic and seasonal distribution of current groundwater quantity and quality are not available.

The Park County Strategic Master Plan (RPI Consulting, 2016) stipulates a need to protect the existing groundwater resources.

7.13.3. Oil and Gas Exploration and Production

Recently it was estimated there might be one trillion cubic feet of natural gas in South Park. The exploration process within the Apache Creek Sandstone, Niobrara Formation, and Dakota Sandstone are at depths ranging from 7,610 to 10,400 feet. The major issues are associated with the production process where hydraulic fracturing is required. The potential impacts associated with the development of several hundred production wells are the fracturing chemical concentrations which are correlated with degradation of groundwater quality. Any releases of natural gas into the groundwater zones may cause impacts to groundwater as well.

Any production activities should be thoroughly scrutinized for their effects to groundwater and surface water associated with drilling and site development issues, such as but not limited to, stormwater, chemical storage, and hazardous chemical use.

Currently, Park County has a set of oil and gas regulations to help address related groundwater quality issues.

7.13.4. Water Quality

To assess groundwater quality, data was collected by the USGS (2001) from 180 wells, and additional data was collected on nitrate levels by the Park County Department of Health and Environment (PCDHE) and the U.S. Forest Service in 2016. Most of the wells were sampled

for physical properties (water temperature, dissolved oxygen, pH, specific conductance), major ions, nutrients, and trace elements, and bacteria. The report can be found at:

<http://parkco.us/631/Groundwater-Quality-Compilation-Study>

There are no site-specific water quality classifications and standards for groundwater within the Upper South Platte Watershed according to Regulation No. 42 (CDPHE-WQCC, 2002).

The highlights from this report are summarized below.

- About 90% of all chloride concentrations in groundwater were at least one order of magnitude lower than the U.S. EPA drinking water standard of 250 mg/l, and no concentrations exceeded the standard.
- In eight of 144 wells, sulfate concentrations were higher than the drinking water standard of 250 mg/l. This occurred primarily in wells completed in sedimentary and volcanic rock aquifers.
- Fluoride was detected at every well in concentrations ranging from 0.1 to 5.6 mg/l. About 10% of the wells exceeded the U.S. EPA drinking water standard of 4.0 mg/l. Nearly all of the wells that exceeded 2 mg/l were located in crystalline rock aquifers (composed of Pikes Peak Granite). These rock formations are primarily found on the eastern edge of central Park County, north of Bailey.

7.13.5. Nutrients

Most nitrate concentrations in groundwater were less than federal drinking water standards of 10 mg/l. Numerous wells in Harris Park and Shawnee were also found to have high dissolved-nitrate levels, a possible indication of septic contamination.

7.13.6. Radon & Uranium

Studies show there are naturally occurring high levels of radon in the groundwater. Currently there is no federally enforced drinking water standards for radon. "Proposed regulations, however, do suggest a maximum contaminant level of 300 picocuries per liter (pCi/L) and an alternative maximum contaminant level of 4,000 pCi/L contingent on other mitigating remedial activities to reduce radon levels in indoor air. Radon concentrations in about 91 percent of groundwater samples were greater than or equal to 300 pCi/L, and about 25 percent had

radon concentrations greater than or equal to 4,000 pCi/L” (USGS Scientific Investigations Report 2007-5220). A median radon concentration of 4,200 pCi/l for samples from 16 wells located east of Fairplay was higher than the national average concentration of 350 pCi/l. In Woodland Park, combined radium 226 and 228 are the primary problems.

Large deposits of uranium are located in South Park, and great concern was expressed over uranium mining in South Park and potential water quality impacts. One of the major problems with uranium mining is the tailings contain uranium decay products. Water from the tailings, especially if left in large ponds or impoundments, can leach heavy metals into the groundwater. Any activities involving the mining of radioactive material in Park County should be thoroughly scrutinized for their effects on groundwater before mining is conducted. Currently, there is no uranium mining taking place.

7.13.7. Metals

Park County has evaluated the drinking water supply and quality impairment in the town of Hartsel. Hartsel is located in a mineral-rich area. It is not yet known exactly what contaminants are involved, although heavy metals (high iron) concentrations are documented. As a result, some residents have installed in-house treatment systems. These were provided by the City of Aurora in direct response to groundwater diversions by Aurora. Also, the water table is dropping in the area, decreasing the availability and quality of the water and causing residents to have to drill deeper, sometimes as deep as 500 feet.

8. Point Source Dischargers

8.1. Overview

Within the portions of Park and Teller counties in the South Platte Headwaters and Upper South Platte, there are currently six major (> 0.05 mgd) discharging wastewater treatment facilities described in Table 8.2. Service area boundaries are only shown for major facilities. Table 8.3 lists the minor discharging facilities (< 0.05 mgd) and Table 8.4 lists the only industrial discharging facility.

8.2. Table: South Platte and Upper South Platte Discharge Locations Major Facilities (> 0.05 mgd)

Discharge	Permit No.	Location	Mgmt Area	Design Capacity (mgd)	Existing Load (mgd)	Permit Expiration Date
Town of Alma	CO-0035769	Middle Fork of the South Platte River	Park	0.117	0.041	10/31/2023
Fairplay Sanitation District	CO-0040088	Middle Fork of the South Platte River	Park	0.3	0.1	06/30/2020
Florissant Water and Sanitation District	CO-0041416	Twin Creek, 0.25 mile west of Florissant along Highway 24	Teller	0.057	0.020	03/31/2019*
Bailey Water and Sanitation District	CO-0020605	North Fork of South Platte River	Park	0.075	0.03	
Will-O-Wisp	CO-0041521	Wisp Creek	Park	0.06	0.025	4/1/2022
City of Woodland Park	CO-0043214	Trout Creek, west of treatment facility	Teller	0.893	0.59	8/31/2020

*Colorado Department of Public Health and Environment Environmental Records search yielded no newer permit/certification

8.3. Table: South Platte and Upper South Platte Discharge Locations Minor Facilities (< 0.05 mgd)

Wastewater Treatment Plant	Permit No.	Permit Expiration Date	Discharge Location	Mgmt. Area	Design Capacity (mgd)	Existing Load (mgd)
Deer Creek Metropolitan District	(Site app approved 12/21/2005)		Deer Creek (trib. of the North Fork of SP River)	Park	0.012	Data not available
Camp Santa Maria	COX-660040 (exp 10/31/2010)		Discharge to groundwater from lagoons	Park	Data not available	Data not available
Quaker Ridge Camp	CO-0044199 (Permit exp date 8/31/2009)		Discharge to groundwater via soil absorption field	Teller	0.011	Data not available*
Camp Shady Brook	CO-0045993		Discharge to groundwater	Teller	Data not available	Data not available
Lost Valley Ranch	CO-0046710		Discharge to groundwater	Park	Data not available	Data not available
Camp Alexander – Boy Scouts of America	COG-588036 (Permit exp date 5/31/2010)		South Platte River (Segment 1a)	Teller	0.012	Data not available
Platte Canyon School District ¹	COG-588108 (Site app approved 6/30/2007)		North Fork of the South Platte River	Teller	0.019	Data not available
Teller County Wastewater Utility	CO-0044211 (Permit exp date 3/30/2012)		Rule Creek	Teller	0.035	0.033

8.4. Table: South Platte and Upper South Platte Discharge Locations Industrial Facilities

Waste Water Treatment Plant	Permit No.	Permit Expiration Date	Discharge Location	Location	Facility Type
London Mine LLC	CO-0038334, new permit filed 9/2018		South Mosquito Creek	Park	Hardrock Mining: Mine Dewatering

8.5. Future Needs Assessment

There has been no recent expansion of wastewater treatment plants, and no future upgrades are expected to meet the population growth in Alma and Bailey. Fairplay Sanitation District built a new wastewater treatment plant which became fully operational in 2009. The Town of Alma is actively pursuing upgrades to their WWTP and is currently working on a feasibility study. Florissant Water and Sanitation District is researching process upgrades to meet effluent ammonia requirements. Bailey is expecting to meet the needs through 2045 and is working on plans to improve sludge handling capabilities and control of the treatment process. Presently Will-O-Wisp is designed for a much larger flow than is currently produced (about 20% of capacity). Anticipated population growth and piping surplus wastewater from neighboring Pine Junction in Jefferson County will hopefully augment Will-O-Wisp's flow. The City of Woodland Park expanded their wastewater treatment plant on June 30, 2018 to better serve the population.

Continued growth is expected in unincorporated areas throughout Teller and Park counties and depending on the location of the housing tracts, it is uncertain if central wastewater treatment service will be possible or if OWTS will be necessary. However, if the need for future central wastewater treatment facilities arises in Park County, it should be limited to the five subareas identified in the Park County Strategic Master Plan (Clarion Associates, 2001), which are Bailey, Fairplay/Alma, Hartsel, Lake George, and Guffey. To minimize the number of septic systems and possible water-quality impacts, future growth in the Hartsel, Lake George, and Guffey areas (areas where wastewater treatment plants currently do not exist) will be evaluated to determine the need for a central wastewater treatment plant.

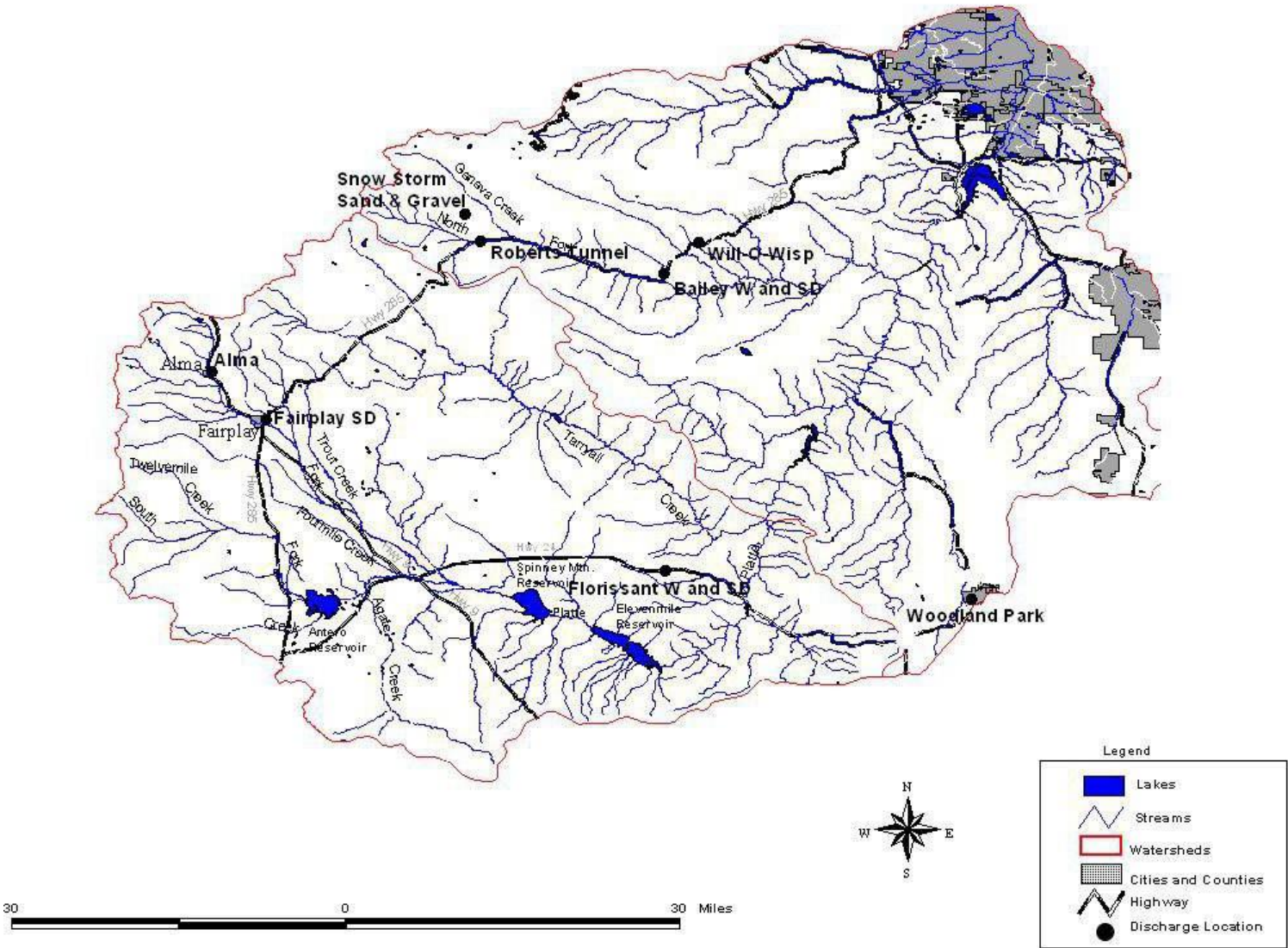
8.5.1. Town of Alma

More stringent phosphorous and ammonia levels will require modifications and upgrades be made to the Town of Alma Wastewater Treatment Plant. The types of modifications and upgrades have not been determined but could include a digester. Currently working on feasibility study to upgrade or explore alternative options.

8.5.2. Florissant Water & Sanitation District

Five-year construction needs include process improvements for winter ammonia reduction, and cell improvements to relieve ice-caused damage to baffles.

8.6. South Platte and Upper South Platte Point Source Discharge Locations



8.7. City of Woodland Park

On March 2, 2017, the City of Woodland Park began construction on its wastewater treatment plant expansion. The \$7.22 million project was overseen by Moltz Construction of Salida Colorado. Completion of the project ended in June 2018 to increase the capacity of the plant to serve a population of 14,100.

8.8. Existing Conditions Major Discharge Facilities

Within the portion of the South Platte Headwaters and Upper South Platte Watersheds in Teller and Park Counties, there are 10 wastewater treatment facilities (six major and four minor discharge facilities discharge into the South Platte or its tributaries). There are also several minor seasonal operating facilities and a number of recreationally based operations utilizing on-site disposal systems. No restrictions are required of these facilities other than those set by the Colorado Department of Public Health and Environment in the CDPS permits.

8.8.1. Town of Alma

The Town of Alma is located in the northwestern part of Park County along Highway 9. Alma was established as a mining community, and the original potable water supply and distribution network were constructed in the late 1800s. A sanitary sewage collection system was not built until 1979.

The treatment facility consists of a two-cell aerated lagoon system with chlorination facilities. The treatment facility was rebuilt in 1992 and the original two-pond system was replaced with a three-pond system with diffused aeration equipment in each pond. The system has a design limit of 0.117 mgd, and the final discharge of effluent is to the Middle Fork of the South Platte River (Upper South Platte River Segment 1a).

8.8.2. Fairplay Sanitation District

The Fairplay Sanitation District was formed in 1970 and shortly thereafter undertook its initial construction to serve the Fairplay area. A new wastewater treatment facility became fully operational beginning in 2009 (the discharge permit issued from CDPHE was effective March 1, 2009). Discharge levels for ammonia are below the permitted limits. The facility discharges to the Middle Fork of the South Platte River. There is also a lift station on the south side of the Platte River that serves the mobile-home park and businesses on that side of the river.

8.8.3. Florissant Water and Sanitation District

The Florissant Water and Sanitation District was created in 1979 to provide water and sanitary sewer service within the district boundaries. The operating system consists of a three-cell lagoon system with aeration of the first two cells. Chlorination is used to reduce fecal coliform and ammonia concentrations to levels that do not negatively affect the existing stream uses of Twin Creek. Dechlorination is used to reduce the effluent residual chlorine levels prior to discharge. The system went into service and operation in the early spring of 1988, and this system now receives 18,500 GPD. Florissant, as part of their permit compliance schedule, has recently completed addressing seepage rates from their lagoon system. The facility discharges to Twin Creek about 0.25 miles west of Florissant.

8.8.4. Bailey Water and Sanitation District

The Bailey Water and Sanitation District was formed in 1969 to provide sanitary sewer service to the Town of Bailey. Prior to this time, residents and businesses in Bailey had OWTS. In 1969, a sanitary sewer collection system was installed along with an extended aeration sewage treatment facility. The sewage treatment facility installed in 1969 did not have adequate capacity and could not meet NPDES permit limitations. Thus, in 1979, a used plant including its equipment was purchased and transported to Bailey. The new facility used the polishing pond of the original facility as an aerated lagoon. The expanded facility also added a mechanical aeration basin and tertiary treatment facilities, which included a chemical mixing basin, sludge settling basin, and a multimedia filter. The district upgraded the WWTP in 1992. Improvements to the plant included a new decant system, a new control system, and a cover for the reactor basin. These upgrades have resulted in a marked improvement in the quality of effluent discharged by the plant, and the district has not had any violations of their discharge permit. Plans are presently being implemented to improve sludge handling capability and to improve the control of the treatment process. The facility discharges to the North Fork of the South Platte River.

8.8.5. Will-O-Wisp Metropolitan

The Will-O-Wisp Metropolitan District is a planned-unit development in the northeast part of the Park County. Its location is approximately 1,000 feet west of the Jefferson County line. The district's wastewater treatment facility was operational beginning in January 1988, and the present flow is 0.025 mgd, about 20% of capacity. This facility is high quality but is designed for a much larger flow than is produced by the current population; thus, it is underloaded and is not operating as efficiently as it might. The facility discharges into Wisp Creek (Upper South Platte River Segment 4) and all monitoring results indicate discharges are well below required state

levels.

A downturn in the real estate market in the late 1980s and early 1990s resulted in no growth to the community. The Will-O-Wisp Metropolitan District declared Chapter 11 bankruptcy and operates under a reorganization plan. With the upturn in the real estate market in 1995 and 1996, the district has grown to 107 homes which are located in Filing One. The original plan projected population for the entire development at 2,747. Projected population is dependent upon development of the remaining four filings, and community growth hinges on the current developer; however, piping surplus wastewater from neighboring Pine Junction in Jefferson County to augment Will-O-Wisp's flow is a possible solution to its under-utilization problem.

8.8.6. City of Woodland Park

The City of Woodland Park provides wastewater treatment for the city, some surrounding areas, and Teller County Water and Sanitation District No. 1. The city is located on a saddle from which gravity wastewater flow naturally splits into north and south drainage basins. All wastewater is treated in an advanced treatment plant located in the north basin adjacent to Trout Creek. Wastewater from the south basin is pumped to the north basin using a 600-gallon-per-minute pump station, 10-inch force main and a 12- to 24-inch interceptor sewer. Two small (88 and 182 gpm) pump stations serve small areas immediately south of the main south lift station.

The Woodland Park wastewater plant discharges to Trout Creek (Upper South Platte River Segment 4), a tributary to the South Platte River, which are both protected as cold-water fisheries. Ammonia removal requirements strongly influenced the plant's design and its current operation.

Woodland Park's wastewater plant was designed for a flow of 0.893 mgd. The current service population is 8,800 and the current peak monthly flow is only 0.63 mgd, but organic loading has prompted the city to initiate planning and designing of a plant expansion. The expanded plant will serve a population of 14,000 with a 1.2 mgd capacity.

8.9. Minor Discharging Facilities

8.9.1. Teller County Wastewater Utility (servicing Divide)

In April 1995, the Teller County Board of Commissioners established, by resolution, the Teller County Wastewater Utility, which services Divide. The utility is directed by a board of directors and is managed by a utility manager.

Currently, the Teller County Wastewater Treatment Facility is operated by the City of Woodland Park's Utilities Department, and billing administration is done by Divide Water Providers, Inc. Wastewater sludge is treated through a contractual agreement with the City of Woodland Park at the city's treatment facility. Future expansion of the plant and the collection system will be based on development in the area. At this time, there are over 1,000 preliminary or platted lots within the current service area. The system produces approximately 0.030 mgd of sewage for treatment. The discharge is to Rule Creek (Upper South Platte River Segment 4), immediately east of the treatment plant.

8.9.2. Platte Canyon School District

The treatment process includes a three-stage lagoon system consisting of aeration, followed by a polishing pond and chlorine disinfection. The peak hydraulic design capacity is 0.019 mgd, and it has an organic capacity of 50 lbs/BOD5 day.

8.9.3. Deer Creek Metropolitan District

The Deer Creek Metropolitan District WWTF was approved in 2003 and is located immediately north of Highway 285, approximately two miles north of Bailey in Park County. It provides service to the Deer Creek subdivision, a 21.68-acre site primarily consisting of commercial developments, a grocery store, retail stores, restaurants, and banks. The design capacity is 0.0125 mgd; discharge is to Deer Creek, a tributary of the mainstem of the North Fork of the South Platte River.

8.9.4. Camp Alexander

Camp Alexander has permit limits for BOD and Total Suspended solids (30-day average/7-day average) which are 30/45 and for *E. coli* which are 6,000/12,000.

8.10. Industrial Facilities

8.10.1. Snow Storm Sand and Gravel

The Snow Storm placer deposit is located midway between Alma and Fairplay along the Middle Fork of the South Platte River. M & M Mining Company was sold to Zigan Sand & Gravel Company and then to the Snow Storm Sand and Gravel Company. The discharge permit is currently inactive. The historic operation of the mine included hydraulic and dredge workings. A 1940s floating wash plant is still currently on site. In 1989, M&M Mining Company submitted a site application for a fresh-water holding pond, a screening plant, two sluices, two settling canals, and a multi-acre main recycling settling pond.

The Snow Storm Sand & Gravel Mine is permitted under the state's general permit for placer mining operations, which also includes provisions for stormwater discharge. The mine was originally permitted to discharge to the Middle Fork of the South Platte River, but under normal circumstances there is no discharge.

The final plot was approved in May 2003 for Glacier Ridge Subdivision, located adjacent to the mining company. This is a 322-acre subdivision containing 62 residential lots and seven acres of open space. The recommendations made by Park County staff were to restore the well water quality and initiate advanced treatment for the septic systems, at least 200 feet from wells.

8.10.2. London Mine LLC

The London Mine Tunnel is located about 12 miles northwest of Fairplay. Hardrock mining is done for gold and silver ore. Both Mosquito and South Mosquito Creeks are water- quality impaired for zinc and will require a total maximum daily load (TMDL).

Historically, zinc concentrations in South Mosquito Creek ranged from 110 µg/L to 749 µg/L, and 95 µg/L to 750 µg/L in Mosquito Creek. The chronic zinc table value standards for South Mosquito Creek and Mosquito Creek are 250 µg/L and 110 µg/L, respectively. The London Mine Tunnel is used for mine dewatering and requires an industrial stormwater permit. A permit renewal and extension were granted in October 2018.

8.10.3. London Water Tunnel

The Colorado Discharge Permit (CO-0038334) for London Water Tunnel, which was constructed in 1918, is for the outfall from the final settling pond. This is approximately one mile above South Mosquito Creek's confluence with Mosquito Creek. The discharge from the final settling pond is in the range of 1.0 to 1.5 mgd from a 2.0-million-gallon settling pond constructed in 1988. The discharge from the final settling pond where it enters South Mosquito Creek is generally lower in mineral content than the creek. The permit for the water tunnel currently has seasonal metals effluent limitations based on the temporary modifications of water quality standards. Discharge from the final settling pond is tested and reported as required by the permit. Since 1991, no mining was conducted in the water tunnel. This permit contains specific standards for metals. During all four quarters of 2009, the water tunnel had effluent violations for dissolved cadmium and dissolved zinc.

8.10.4. Extension Tunnel

A permit (CO-0045209) has also been issued for the effluent from the extension tunnel. The

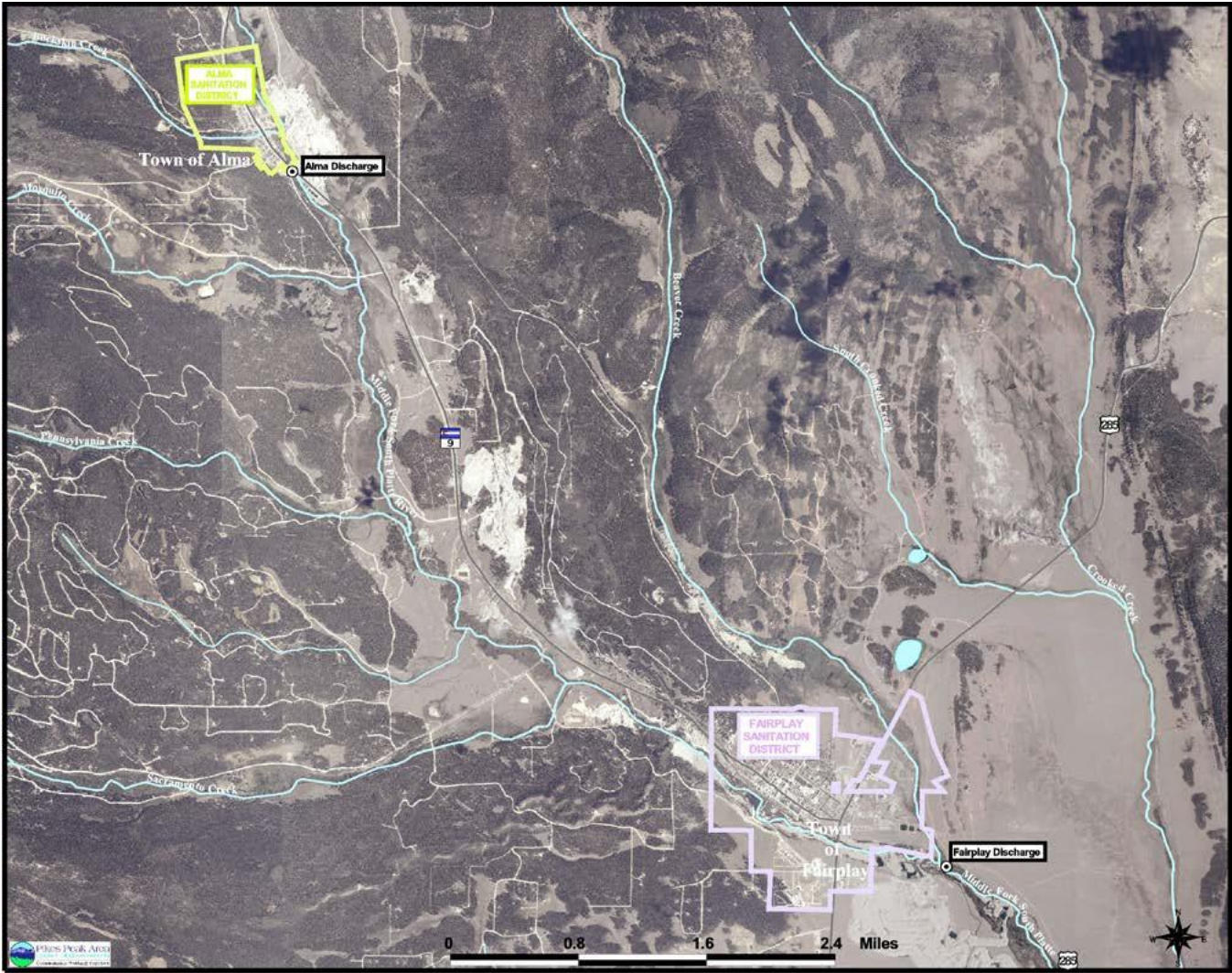
extension tunnel water is collected at the tunnel entrance via a small corrugated plastic pipe to an unnamed creek. This discharge point is several hundred feet above the confluence of the unnamed creek and South Mosquito Creek. During several quarters of 2009, the extension tunnel had effluent violations for dissolved cadmium, dissolved zinc, total suspended solids, and pH (EPA Enforcement and Compliance History).

The London Extension Tunnel has not been reclaimed, and various treatment options are still being considered. This erosion substantially increased the sediment and metals loading in Mosquito Creek. As part of a 319 Nonpoint Source project in 1998, tailings were consolidated, regraded and revegetated. Drainage channels also were excavated around the tailings in the lower valley. In 1998, a neutralizing system, diversion ditches, and settling pond spillway were built by the Division of Minerals and Geology. Sediment loads during storm events were demonstrably lower than pre-319 project conditions.

8.11. Major Point Source Service Area Maps

A summary of point source data is presented in Table 4, Appendix C, which shows information obtained from the treatment facilities. Service area maps show projected service area boundaries for each facility previously described. The background of these maps is Google Earth satellite imagery which was last updated in September 2005. Major point source discharge locations are shown on the service area maps.

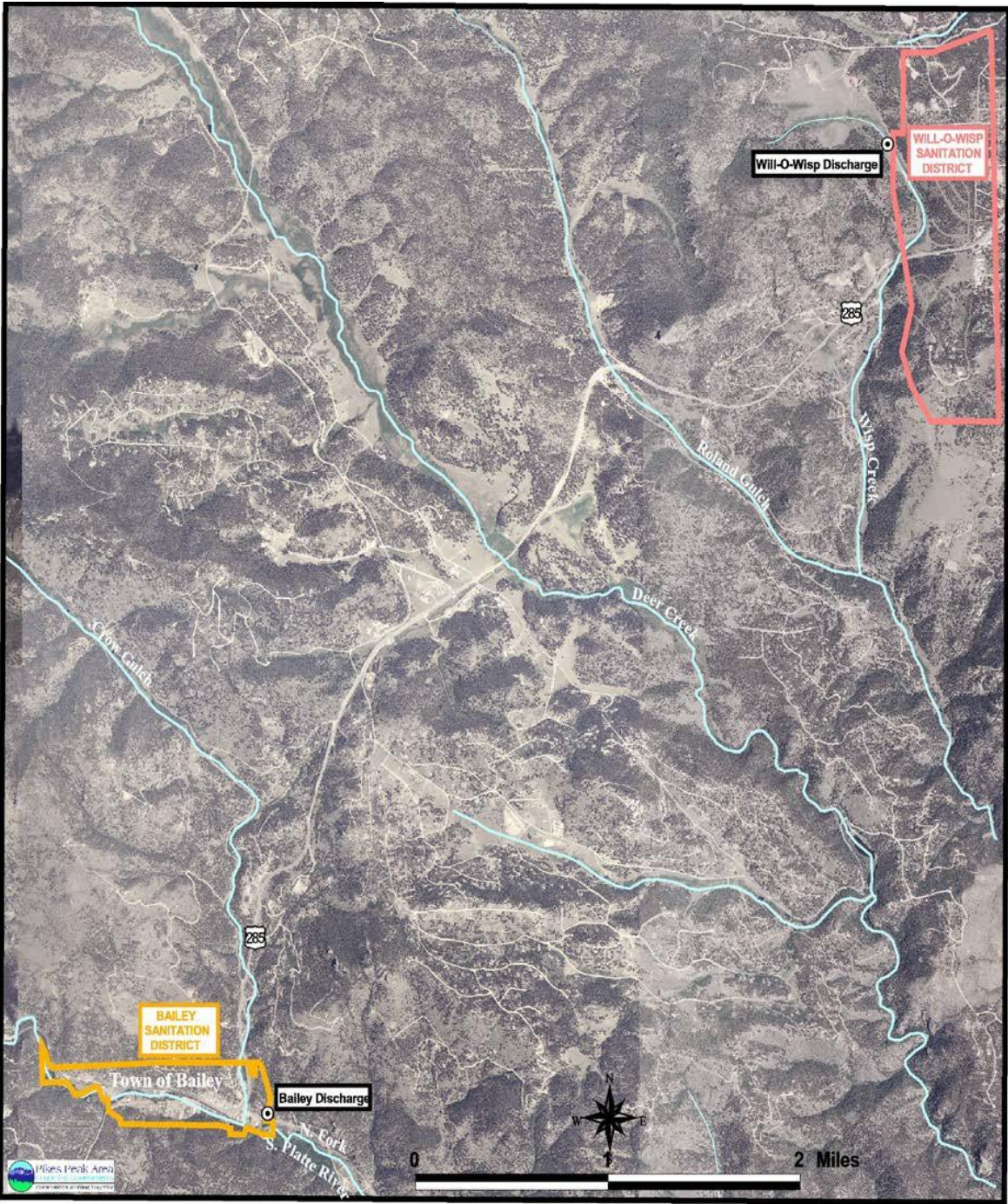
8.12. Figure: Alma and Fairplay Sanitation District Service Area



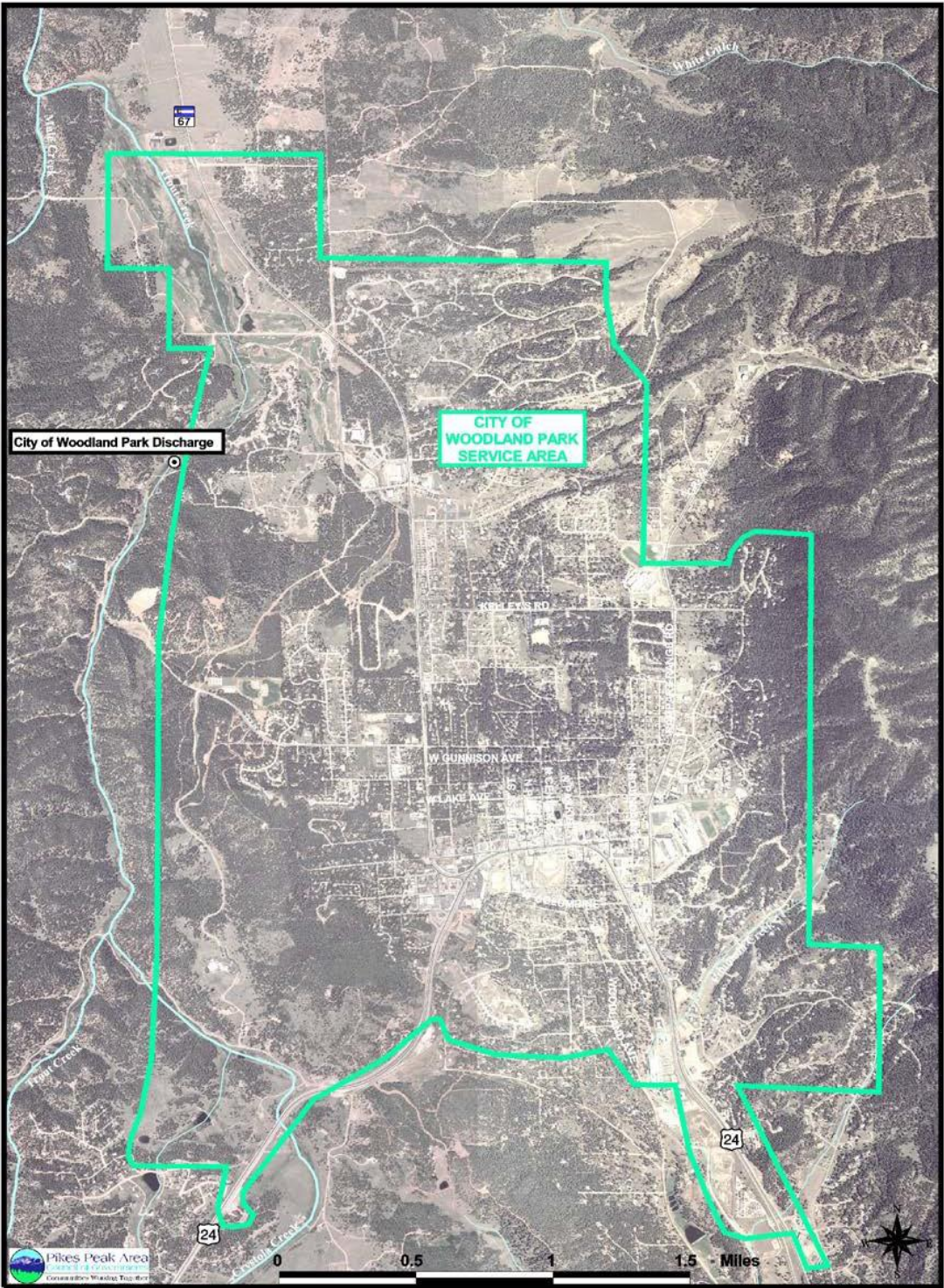
8.13. Figure: Florissant Sanitation District Boundaries



8.14. Figure : Bailey and Will-O-Wisp Sanitation District Service Area



8.15. Figure: City of Woodland Park Service Area



8.16. Nonpoint Source Assessment

Nonpoint source pollution is defined as a degradation of water quality from diffuse sources. This section will cover the effects on groundwater and surface water from agriculture-silviculture, hydrologic modification, land disposal, solid water disposal, resource extraction, OWTS, and recreation.

8.17. Agriculture and Silviculture

There is very limited agriculture in Park County. In the eastern portion of the watershed, agricultural lands consist primarily of riparian and mountain grasslands which are situated on private lands along the river. The total number of acres being farmed or ranched decreased by 30% from 1987 to 1997, from about 400,090 acres in 1987 to 311,182 acres in 1997 (Clarion Associates, 2001). These areas are used primarily for livestock grazing and a minor amount for hay production. Fertilizer runoff from hay meadows and pesticide runoff from noxious weed spraying are potential sources of pollution in the county, but there is no documentation of the problem from these sources. The Conservation Districts and the Natural Resource Conservation Service are encouraged to continue their educational efforts to promote effective utilization of these products without damaging the receiving waters. Some BMPs found effective in minimizing the amount of erosion include grazing management techniques and strategies such as rotational grazing, deferred grazing, proper grazing use, critical area treatment, sediment basins, and grade stabilization structures (CDPHE-WQCD, 2000).

Erosion in riparian areas from overgrazing continues to be a problem on private and public lands. Many ranchers have instituted conservation measures such as rotation and deferment to decrease the erosion; however, a problem still exists in some areas such as Spring Creek. Erosion also occurs through activities such as building roads. BMPs suggest the use of vegetation and/or structures in-stream and on immediately adjacent areas of streams, or construction of channels to stabilize and protect against erosion.

Silviculture is the practice of caring for forests with respect to the human objective. This is extremely important in the South Platte and Upper South Platte Watersheds due to the number of fires that have occurred recently within the region. Silviculture imitates a natural change—such as a beetle infestation or fire—and these methods can be effective at reducing the severity and possibility of fire in the future.

8.17.1. Wildfires

Due to the drought, wildfires are an increasing concern in this region. During the past nine years, there were two major wildfires and numerous smaller wildfires within the watershed. Major fires include:

FIRE	COUNTY	Number of Acres Burned
2018 Weston Pass fire	Park	13,023
2012 Springer	Park	1,100

The 2012 Waldo Canyon fire burned over 18,000 acres across four major watersheds, Camp Creek, Douglas Creek, Fountain Creek, and West Monument Creek. Although the fire did not occur near the Upper South Platte Watershed, CUSP responded with a variety of post-fire recovery efforts, along with monitoring efforts to assess the effectiveness and resilience of post-fire watershed treatments in the Waldo Canyon burn scar. In 2013, a watershed assessment was conducted for the Waldo Canyon Fire burn area using the WARSSS methodology: Watershed Assessment of River Stability and Sediment Supply (Rosgen, 2006/2009). The assessment can be found at <https://cusp.ws/wp-content/uploads/2014/10/1.WaldoCanyonFireAssessmentReport.pdf> along with other report efforts at <https://cusp.ws/reports/>

High sediment levels in the creek can lead to sediment build-up in Cheesman and other reservoirs, which can cause a reduction in the amount of water storage, and can require costly strategies to remove the sediment. The US Forest Service and CUSP are using techniques that include seeding, planting trees, trenching to slow down and divert water, and constructing temporary dams or placing straw bales in gullies to promote rehabilitation and restoration of the land. In spite of these ongoing efforts, areas of the watershed at high to moderate intensity are still vulnerable to intense erosion, as witnessed in Teller and Douglas counties in 2007 and Douglas and Jefferson counties in 2009. Community wildfire protection plans were adopted by Teller and Park counties, and they are working with the US Forest Service, CSFS, CUSP, and local fire protection districts to mitigate fuels.

8.17.2. Conservation Easements

Conservation easements have become an important tool in Park County and other communities to preserve areas for future protection. Some important conservation easements have occurred since the last update of the plan in 2010, which include:

- Allen Creek Ranch: This property is located along Park County Road 77 and abuts the Pike National Forest. In addition to its scenic values, Allen Creek Ranch contains over 3 miles of Tarryall Creek and supports one of the best examples of a globally rare riparian community comprised of blue spruce and water birch. The Ranch also contains mixed conifer forest, grassland, willow thickets, and irrigated hay meadows. The conservation easement also protects water rights used to irrigate hay meadows and Tarryall Farms. Allen Creek Ranch is now open to public fishing, on a reservation basis, at South Park Fly Fishers. Funding for the Allen Creek Ranch conservation easement was provided by Great Outdoors Colorado, the Park County Land & Water Trust Fund, Colorado Division of Wildlife, National Fish & Wildlife Foundation, and the Hillsdale Fund, Inc.
- Deer Valley Park Association: Colorado Open Lands is coordinating fundraising efforts on behalf of the Deer Valley Park Association. The goal is to secure adequate funds to purchase a perpetual conservation easement on this Centennial Ranch. Centennial Ranches are ranches owned and operated by the same family for 100 years or more. To this end, the Park County Land & Water Trust Fund has committed \$500,000 toward the purchase of a conservation easement valued at \$1.5 million.

Further reports on Park County conservation easements, along with an easements map, can be found at <https://parkco.us/646/Conservation>

8.18. Hydrologic Modification

Hydrologic modification in Park County has historically taken place for irrigation of agricultural land. However, most of the agricultural water rights were bought by Front Range municipalities, which are using hydrologic modification to provide drinking water. The effects of the diversions and reservoirs on the water chemistry of the stream basins have not been documented. This has become an extremely critical issue recently because of the drought.

Streamflow in the basin is driven by snowmelt, with the majority of the runoff volume occurring in the late spring/early summer. Low flow for these streams happens in the late fall and winter, and most rainfall runoff in the basin comes from summer convective storms and

upslope rainstorms. The natural flow regime was modified over the past 150 years due to irrigation, water diversions, introduction of transmountain water, and water storage reservoirs.

8.18.1. Transbasin Diversions

Denver Water's Roberts Tunnel and Aurora's Otero Pipeline are the two major transbasin imports into the Upper South Platte River. The Roberts Tunnel delivers water from the Lake Dillon collection system to the North Fork of the South Platte just upstream of Grant, Colorado. The City of Aurora imports water from the Homestake Project and other Colorado and Arkansas water supplies via the Otero Pipeline into Spinney Reservoir.

Aurora and the City of Colorado Springs equally own the Otero Pipeline. Roberts Tunnel is discussed in Section 6.3, South Platte and Upper South Platte Point Source Discharge Facilities.

Other transbasin imports include the Boreas Pass Ditch and Colorado Springs Blue River Tunnel. Both of these are minor inputs into the Upper South Platte River. Colorado Springs will usually take Blue River water via a pipeline but can release water into the South Platte.

The City of Aurora lost the conjunctive use case. This project would have pumped groundwater from the South Park aquifer for use by the City of Aurora to maintain its existing needs and to meet future needs. However, Park County continues to meet with Aurora on possible options in the future to transfer water. The future storage needs of Aurora are 35,000 - 40,000 acre feet; Denver needs 80,000 acre feet and Park County needs 1,000 - 1,500 acre feet.

8.18.2. Roberts Tunnel

The Roberts Tunnel, owned and operated by the Denver Water Department, diverts high quality water from Dillon Reservoir in Summit County and discharges it into the North Fork of the South Platte as part of its water supply for the Denver area. The Roberts Tunnel brings about 23% of Denver's water from Lake Dillon to the North Fork. A 1985 agreement between Summit County and the Denver Board of Water Commissioners allows tertiary treated effluent from wastewater treatment facilities discharging to Dillon Reservoir to be discharged directly to the Roberts Tunnel when Denver is transporting a minimum of 50 cubic feet per second through the tunnel.

The Snake River Wastewater Treatment Plant, owned and operated by Summit County, has

received approval from the Northwest Colorado Council of Governments for the potential future direct discharge to the Roberts Tunnel. Northwest Council of Governments' water quality and quantity efforts are involved in Technical Assistance (TA) programs dealing with water resource development and water quality protection. They are currently involved in water quality with regard to phosphorous load allocations from the Roberts Tunnel; regulations that might indirectly affect Park County land use; and setbacks to OWTS. Under the CDPHE WQCC, Division Reservoir Control Regulation (Regulation #71, 2007), the Snake River WWTP is allowed a phosphorus discharge of 340 lbs/year.

Residents of Park County are very concerned about potential water-quality degradation to the North Fork South Platte. Communities in Park County that utilize the South Platte as a water supply include Grant, Santa Maria, Bailey, Insmont, Mooredale, Glen Isle, Shawnee, and Eastbrook.

8.18.3. Reservoirs

Reservoirs are a major factor in the modified hydrology regime. The principal reservoirs in the Upper South Platte Basin are Antero, Eleven Mile, Cheesman, Spinney Mountain, Tarryall, and Strontia Springs. Denver Water owns and operates Antero, Eleven Mile, and Cheesman reservoirs. The City of Aurora owns and operates Spinney Mountain Reservoir. Denver and Aurora jointly operate Strontia Springs Reservoir. Taryall Reservoir is owned and maintained by CPW. Other reservoirs include, but are not limited to, Jefferson Lake, Wellington Lake, Montgomery, and Lake George.

Invasive aquatic species have become a major concern for reservoirs in the watershed. Zebra and quagga mussels were found in the state, and CPW is concerned these may be transported to reservoirs in the watershed. Currently, the CPW employs seasonal employees at the reservoirs to inspect all boats entering and leaving the lakes for transport of invasive species.

8.18.4. Wetlands and Peatlands

Other areas that have experienced the effects from hydrologic modifications include the peat fens and wetlands. Wetlands and peat fens provide important wildlife habitat and water filtration functions. Park County has some unique peat fens with species not found anywhere else in the continental United States. The unique beneficial water-quality features of these fens are discussed in the water quality analysis section of this report.

The High Creek Fen was nationally recognized for its unique species and has been acquired by

the Nature Conservancy. Unfortunately, some of the lesser fens were mined and have suffered irreversible damage to their filtering capacity. A report entitled *An Evaluation of the Effects of Peat Mining on Wetlands in Park County, Colorado* was completed in February 1990. In addition, an inventory of the calcareous fens was completed (Johnson, 1998; Johnson, 1996) and is described in more detail in the Surface Water Section for the South Platte Basin.

The Colorado Natural Heritage Program (CNHP) completed the Park County Inventory of Critical Biological Resources in April 2001. CNHP uses a multidisciplinary team of scientists and information managers to gather information on rare, threatened, and endangered species and significant plant communities in Colorado. Scientists study life history, status, and location of the species; information is entered into the Biological and Conservation Data System and then mapped using GIS technology. The final job is to rank the most sensitive or imperiled Potential Conservation Areas (PCA).

In Park County, the CNHP team identified 35 PCAs that are home to over 115 rare or imperiled plant species, animal species, or significant planning communities. Nine recommendations were made for protecting Park County's biological resources.

South Park is one of only a few areas in Colorado designated as a state wetlands focus area by the Colorado Wetlands Initiative Program, administered by the Colorado Division of Wildlife. The South Park Wetlands Focus Area Committee has secured over \$7 million for conservation easements since 1999. High Creek Fen, located in South Park, is one of the most biologically diverse fens known in the Southern Rocky Mountains and contains more rare plant species than any other wetland known in Colorado. The Nature Conservancy owns about 1,200 acres of High Creek Fen and plans to purchase about 560 acres of high- quality wetlands and 4,500 acres of uplands in the High Creek Basin. The goal of the wetlands initiative in South Park is to ensure these predominately natural wetlands are protected (Division of Wildlife, Strategic Plan for the Wetland Wildlife Conservation Program , <https://cpw.state.co.us/Documents/LandWater/WetlandsProgram/CDOWWetlandsProgramStrategicPlan110804.pdf>). The wetlands initiative, with the support of private landowners and the county, is expected to protect 7,350 acres.

8.18.5. Park County Peatlands

Park County's peatlands were subjected to a number of significant types of disturbances since the area was settled in the 1800s. Historically, ditching was probably the most critical disturbance to the peatlands. Ditching was undertaken to dry the peatlands so they could be

converted to agriculture. While the ditching and draining of peatlands still occurs, currently the most significant threat to these sites is peat mining. Peat is a partially decomposed plant material that has accumulated over the centuries. It is extracted from these sites primarily for use in agriculture and home gardens, but it is also sometimes removed to create ponds or to expose underlying mineral deposits.

Peatlands comprise a small but important part of Colorado's natural lands and are often associated with rare or imperiled wetlands known as fens. These wetlands provide unique and irreplaceable habitat for a number of rare plants and perform many important environmental functions.

An additional concern for water quality planners is , after mining, operators are required to perform little or no site reclamation or restoration. This is diametrically opposed to ore-mine regulations, which require operators to perform extensive site restoration upon cessation of mining activity. This policy is mainly a bureaucratic artifact because wetland decisions fall primarily under the jurisdiction of the US Army Corps of Engineers, rather than under state or federal mining agencies. Although peat miners are not subject to a consistent policy with regard to site reclamation, governmental managers should be prepared with a reclamation strategy because many of these sites reside on public lands.

8.18.6. South Park Heritage Resource Area (SPHRA) Study

South Park was designated a National Heritage Area on March 30, 2009. The designation was part of an Omnibus Public Lands Management Act, and now this area is one of 49 National Heritage Areas across the country and only one of three in Colorado. The same process utilized in South Park will be used for Tarryall Creek, where future restoration and protection options are now being developed for areas along the Creek. A report exploring these options, *Tarryall Creek Restoration Overview Report* (2002), has already been completed. In order for the County to apply for grants, they developed a 10-year master plan in April 2013. This designation is expected to enhance tourism and provide access to federal funding. The master plan included four goals:

1. Conserve and enhance South Park's natural, cultural, and recreational resources.
2. Facilitate partnerships between local, regional, and national organizations that will benefit South Park.
3. Provide responsible interpretation of, access to, and education of South

Park's resources to the public.

4. Promote South Park's resources to generate sustainable economies.

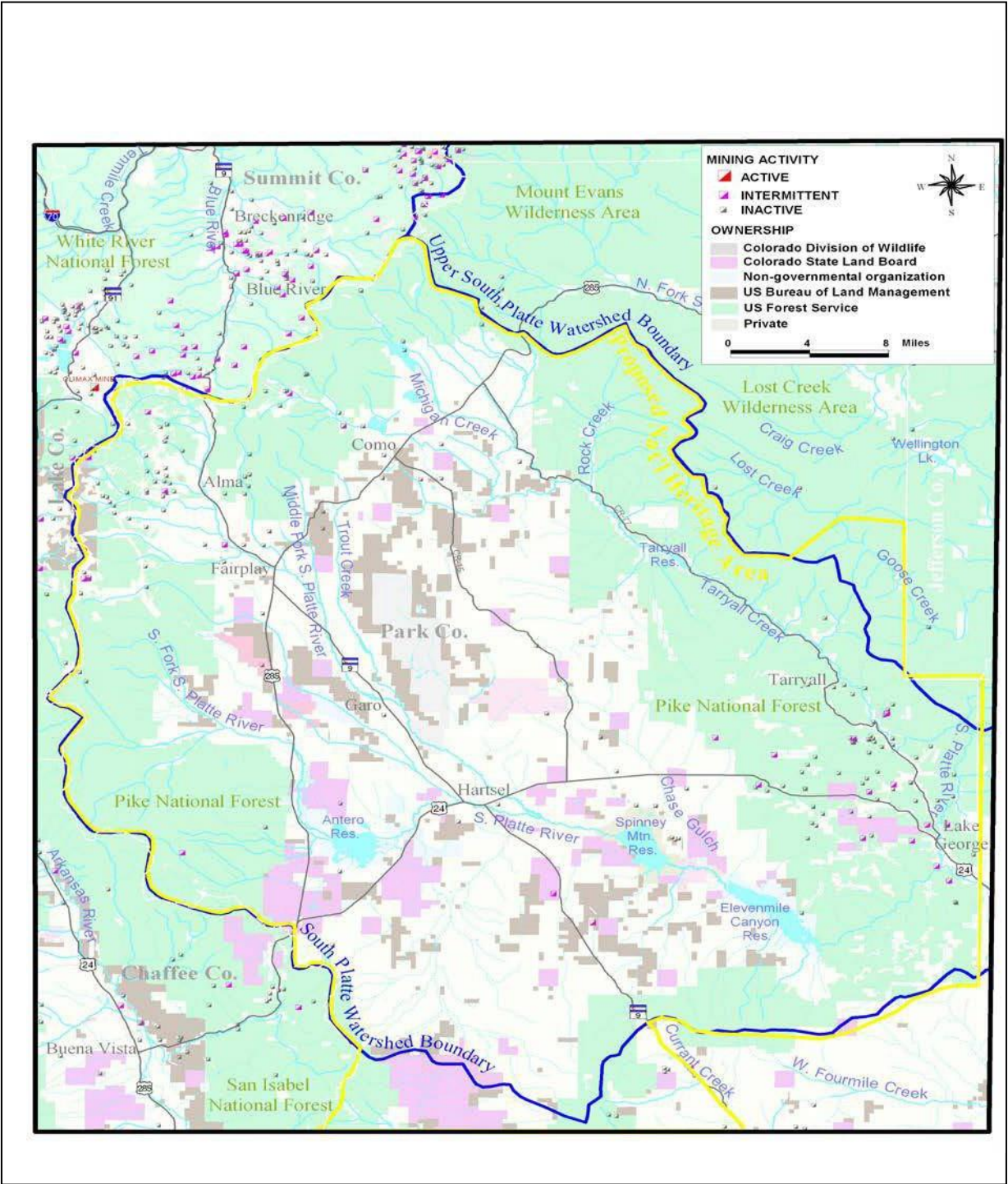
The full master plan can be found here:

http://www.southparkheritage.org/sites/default/files/uploads/spnha_plan_web.pdf

The purpose of the *South Park Heritage Resource Area Study*, conducted in 1996, was to identify key resources that express South Park's heritage through time. The study area was located in the 900 square-mile basin of South Park and included surrounding upland areas, the Mosquito Range, the Tarryall Range, and the Thirty-Nine- Mile Mountain Volcanic area. In this study, South Park was identified as having more "fens" than any other region in the continental United States and over 50,000 acres of wetlands (Shapins Associates, 1996).

Priority actions were developed to build support for heritage conservation, to help traditional industries remain in production, and to conserve heritage resources having the highest value and greatest impact potential. The study contains strategies that provide a basis for future efforts such as partnership building, cooperative planning, tourism management, resource conservation, environmental education, and resource interpretation. This effort was the first step towards acquiring conservation easements and retaining high-priority ranchlands as productive agriculture areas.

8.19. South Park Resource Heritage Area Boundary and Mining Locations



8.20. Development of Conservation Easements

The Heritage Resource Study provided the impetus for conserving the highest priority property in South Park (Wahl-Coleman Ranch) in 1999. Following this, Park County received an EPA Regional Geographic Initiatives Grant in 2000 to initiate the Upper South Platte River Conservation Planning Project. This Plan targeted stream corridor properties containing significant agricultural, riparian, and/or wetland resources.

In December 2002, Park County was awarded grants by GOCO (\$3.5 million) for the long-term conservation and restoration of South Park's outstanding natural resources, including river corridors, rare wetlands, and working cattle ranches. The project involved more than 16 participating landowners, to ensure the conservation of more than 13,000 acres and over 28 miles of stream corridor. The funds were used to purchase conservation easements (acquire the rights to develop land, but do not actually purchase the land) on targeted properties with wetland and riparian habitats in South Park. The funds provided stewardship endowments for the easements along the South Fork of the South Platte River, Fourmile Creek, and Agate Creek. The lands included in this study are wetland and upland habitats that support rare or imperiled species. Among the resources preserved are one of the largest concentrations of rare or imperiled plant communities in the lower 48 states and the most Gold Medal trout water in Colorado (*Fairplay Flume*, 2002).

8.21. Solid Waste Disposal

The primary method for solid waste disposal in the county is the use of transfer stations. The designated transfer stations collect solid waste for transport to landfills outside of the county. No landfills are expected to be built in Park County in the near future. Illegal dumping into ditches and ravines is a problem in the county. Most of the transfer stations collect recyclable glass, newspaper, aluminum, plastic, magazines, and office paper. The recycling of these items results in a reduced load to the landfills. Waste lagoons in Park County consist of municipal or animal waste lagoons or mine ponds. It is not known how many, if any, of these are potential threats to the groundwater near them.

8.21.1. Land Use

Park County recently completed making major revisions to their Land Use Regulations (<https://parkco.us/189/Land-Use-Regulations>). Revisions to the land use codes address some of the major current and probable future anthropogenic impacts to surface water and groundwater quality. Major changes that could improve water quality management in the

future are:

- Floodplain setbacks that are 100 feet in all zones for new lots and will be measured from the middle points of the streams.
- Wetlands protection –a 50-foot setback in wetland areas
- Developers must be able to prove availability of surface water for a central water supply.
- Requirements for drainage control.
- Requirements for Erosion and Sedimentation Control Plan.
- Requirements for wildfire mitigation.

8.21.2. 1041 Permits

Requests for 1041 permits have increased in Park County, especially wildlife habitat, water, and wastewater permits. These permits are designed to facilitate identification, designation, and administration of matters of state and local interest that are beyond the scope of traditional zoning or subdivision regulations. One of the purposes of requiring these permits is to ensure the environmental impacts of new development are considered and mitigated. Through 1041 permits, local governments can designate areas of state interest, which include mineral areas; natural hazard areas; areas containing historical, natural or archeological resources of statewide importance; and areas around key facilities (airports, public utility facilities, and mass-transit terminals). However, a developer does not have to agree on any conditions imposed in a 1041 permit, but any conditions imposed on the 1041 permit approval shall be followed by the developer or the developer will be subject to legal actions.

8.22. Urban Runoff

Although covered under an MS4 permit coverage area, roadside erosion is also a serious problem in the more developed areas of the eastern section of the watershed. Increased potential for soil erosion occurs in areas of high human activity. When the soil's protective vegetative cover or topsoil is disturbed, on-site productivity is reduced and water quality is degraded by sedimentation. The amount of sediment, oils, and solvents released through urban runoff will increase as commercial and residential development continues in the two counties. Recent NPDES Phase II Stormwater Regulations have not affected Park or Teller counties or any of the municipalities within them.

8.23. Recreation

Mountain biking, camping, skiing, hiking, and fishing are the primary tourism activities in the area, but snowmobiling and use of off-road vehicles are growing rapidly. The number of people enjoying these activities is increasing yearly, with Highway 285 becoming congested during the weekends. In addition to vehicular emissions, the heavy use of the counties for tourism is adversely affecting the water quality through erosion from overuse of unsurfaced roads, backcountry trails, campgrounds, and reservoirs. There may come a time when permits are needed to preserve some of these areas for everyone to use. Many of the abandoned logging roads become heavily used by tourists, resulting in washboard conditions, large ruts, and erosion.

8.24. Resource Extraction

Historically, lode mining for gold played a big role in Park County, but operations have shifted towards surface mining of sand and gravel and other raw materials. Currently, there is a sand and gravel operation along the Middle Fork of the South Platte. Past mining activities have degraded portions of the South Platte River include Geneva Creek in Platte Canyon, Mosquito Creek, and South Mosquito Creek near Fairplay; Tarryall Creek and Buckskin Creek near Alma; and the headwaters of the South Fork in the southwest section of the county. The impact of these mining activities is further discussed in the water quality analysis section.

Abandoned mines and tailings are the primary sources of elevated metals in streams with natural mineral seeps as secondary sources. In general, surface water is greatly affected by resource extraction while aquifers are not. Natural geologic conditions can also cause low pH levels, and some metals are transported in the streams in the dissolved phase because of the low pH. As the pH of the water rises, the metals become attached to suspended sediment and travel further downstream until they are deposited along the riverbanks. The dissolved species are a primary indicator of potential drinking water problems, especially when shallow wells are drilled within these areas. In general, waters with high dissolved-metal species tend to be devoid of aquatic life because of acute toxicity and can pose long-term problems for aquatic life.

8.24.1. Alma American Milling Corporation

The American Mill was a precious metals mill that produced gold, silver, lead, copper, and zinc concentrates from ore. During operation, approximately 200 tons of ore were processed daily.

Its effluent discharged into Mosquito Creek. Due to market conditions, the mill was shut down since 1984. The mill was removed and its holding pond filled and leveled off. Although issued a discharge permit in 1993, the mill will remain closed indefinitely.

8.24.2. Montgomery Mill

Natural revegetation occurred at some of the historic mill tailings at the Montgomery Mill site (also referred to as Alma/Betts in some documents). However, metals were being leached from nonvegetated tailings on the south side of the valley by water flowing over and through the tailings. In 1991, the nonvegetated tailings were moved from the valley to an area above the water table and adjacent to the remains of the old Alma/Betts Mill. The tailings were then covered with soil from the site and revegetated in 1992. Partial funding for these activities came from the 319 Nonpoint Source Grant with in-kind services provided by Park County and the Colorado Parks and Wildlife (CPW), Trout Unlimited, and the Park County Mining Association. The results of this work can be found in the Preliminary Assessment, London Mines/Mosquito Creek Basin (CDPHE – HMWCD, 1998).

8.24.3. London Mill

Erosion of the London Mill tailings contributed sediment to South Mosquito Creek. Drainage through the nine-acre tailings flowed through three ditches that were eroded in places to a depth of 20 feet. In addition, wind erosion moved the tailings downstream. To reclaim the area, the slope of the tailings piles was decreased to minimize erosion. The drainage flow was channeled into a settling pond before discharge into South Mosquito Creek. The entire area was covered with soil and revegetated in 1992.

8.24.4. Buckskin Gulch

The Division of Reclamation, Mining and Safety conducted water quality sampling and analysis on the Buckskin Gulch mine drainage (draining Red Amphitheater just above Buckskin Gulch Road) during the summer of 1990. The lab analysis indicated elevated levels of zinc, manganese, aluminum, and strontium. Water quality at the Alma intake two miles downstream of Red Amphitheater is within acceptable limits. Subsequent assessment indicated the metals were of natural origin, resulting from erosion of the Amphitheater itself.

8.25. Onsite Wastewater Treatment Systems (OWTS)

Wastewater generated in densely populated areas is primarily treated at municipal wastewater treatment plants (WWTPs); however, septic systems are used in rural areas where wastewater treatment systems are not economically feasible. Septic systems have the potential to contaminate groundwater and surface water, either through percolation of wastewater through the soil into groundwater, which recharges surface water, or by surface runoff. If septic systems are improperly designed or installed in soils unsuitable for the disposal of wastewater, nitrate can leach into groundwater and can seep into nearby surface waters. Surface water contamination from septic systems can also occur due to system failure. When a septic system fails, the capacity of the soil to absorb effluent is exceeded and waste moves to the soil surface, where it can be carried to surface water via overland flow. However, if septic tanks are not immediately adjacent to surface water, the potential for nitrate to leach into the surface water is minimal.

A major concern of septic systems is that a high density of systems in one area can lead to ineffective treatment. Small parcel sizes cause septic systems to be placed closer together and increase the possibility of groundwater contamination. Depending on the underlying soil, effluent can move faster or slower down to the groundwater, as is evident in southeastern portions of the watershed.

For the majority of Park County citizens, OWTS is the method used for disposal. Between 1991 - 2002, Park County issued an average of 500 permits a year, and between 2002 - 2008, Park County issued 300 permits a year. Inadequate systems may be affecting groundwater, particularly in the northeastern and northwestern portions of the county where rapid growth is occurring (Park County Strategic Plan). Park County has two full-time inspectors who are conducting OWTS as well as non-community groundwater inspections.

Many of the current systems are designed by engineering firms. These systems appear to be an effective means of sewage treatment on lots 35 acres or larger. Inadequate systems may be affecting groundwater in the county, particularly in the northeastern and northwestern sections, which have experienced phenomenal growth in the 1990s. The Park County Environmental Health Department collected samples in 1997 that indicated elevated nitrate concentrations in the northeastern section of the county around Bailey.

There is evidence that implies many homes constructed as summer homes and converted to year-round homes may have inadequate systems. The higher density of small developed lots,

especially the 0.25 to 1 acre lots, combined with an inadequate distance between the leach field and household wells in fractured rock areas, may be stressing the soil's absorption capacity and contributing to a degradation of groundwater in some areas. However, tertiary treatments are being used in a majority of these situations in hopes of reducing some of these known effects.

Education regarding OWTS is becoming critical as the vast majority of the new citizens of Park County are people who have never lived in a rural setting before. The Park County Environmental Health Department releases information in pamphlets, newspapers, and a website explaining the need for proper disposal, testing, and monitoring of an OWTS. Many of these new residents do not realize the damage that can occur to an OWTS from disposal of household cleansers, and paint and overuse of dishwashers and garbage disposals. They also may be unaware of the need for testing, monitoring, and ongoing maintenance. In addition to testing and monitoring, most do not realize the systems need ongoing maintenance. Owners of new systems currently receive a fact sheet from the Environmental Health Department, and with the assistance with the local real estate organizations, new owners of older homes also receive this educational material.

Teller and Park counties have both adopted regulations requiring a 200-foot separation between a septic system and a well. This helps minimize the amount of contamination and will dilute the effluent before it gets picked up in the well. Setbacks are required to be 50 feet from wetlands and 50 feet from an irrigation ditch.

USGS in cooperation with Park County conducted a water quality study (2001-2004) to determine the effects on groundwater quality of residential development and the corresponding increase in the number of OWTSs on groundwater quality. The data collected indicates recharge from OWTS effluent has affected local groundwater systems. Concentrations of constituents associated with OWTS effluent are low and drinking water quality is good throughout the county. There are some correlations between geology, lot sizes, and year of OWTS installation. In general, groundwater quality was least affected areas with average lot sizes greater than five acres and most affected in areas with average lot sizes of less than one acre.

9. Water Quality Management Associations and Watershed-Based Groups

This section discusses wastewater operating agencies, management agencies/associations, and watershed groups/organizations in the Upper South Platte and South Platte Watersheds.

9.1. Wastewater Operating Agencies

The following organizations are recognized as wastewater operating agencies within the South Platte/Upper South Platte Watershed. These agencies are responsible for controlling all aspects of the collection, treatment, and discharge of sewage or any industrial concerns within their company's sphere of operation. Each of these operating agencies is discussed in further detail in Section 6.3, South Platte and Upper South Platte Point Source Dischargers.

- Alma Sanitation District/Town of Alma
- Fairplay Sanitation District/Town of Fairplay
- Florissant Water and Sanitation District
- Bailey Water and Sanitation District
- Will-O-Wisp
- City of Woodland Park

9.2. Management Agencies/Associations

A management agency currently does not exist but is recommended to be formed for the South Platte/Upper South Platte Watershed. The management agency should cover the boundaries of the South Platte/Upper South Platte within Park and Teller counties.

9.2.1. Teller and Park Counties

Teller and Park counties have their own individual environmental health departments that process septic system permits and regulate water quality, solid waste, and other environmental health concerns.

9.2.2. Chatfield Basin Authority

The Chatfield Basin Authority is the water quality management agency for Chatfield Basin. The Chatfield Reservoir watershed, although not located in Park County, is downstream of the Upper South Platte River Watershed. The authority developed a phosphorus load allocation system for wastewater treatment plants and nonpoint sources within the Chatfield basin.

Sources of phosphorus upstream of Strontia Springs Reservoir were identified as base-load or background sources and are included in this allocation. As stated in the Chatfield Reservoir Control Regulation (Regulation #73, effective 3/30/2009), of the total annual 59,000-pound phosphorus load for Chatfield Reservoir, the Upper South Platte River Watershed is allocated a total of 17,930 pounds per year. This allocation accounts for all point and nonpoint sources combined, including the 88 pounds per year that originates in Summit County and is discharged into the Roberts Tunnel.

9.3. Watershed Groups/Organizations

9.3.1. Coalition for the Upper South Platte (CUSP)

The Coalition for the Upper South Platte (CUSP) was formed in 1998 to serve as a forum for stakeholder discussions and recommendations regarding water quality and aquatic habitat issues in the watershed. CUSP is active in water quality concerns and protection strategies but has only an advisory role with no regulatory authority.

The mission of the Coalition for the Upper South Platte (CUSP) is to protect the water quality and environmental health of the Upper South Platte Watershed, through the cooperative efforts of watershed stakeholders, with emphasis on community values and economic sustainability.

CUSP was formed in 1998 as a response to the Buffalo Creek fire and the devastating flooding that followed. CUSP works with federal, state, non-profit and private partners to provide essential services such as project planning, implementation and monitoring within the watershed.

CUSP is active in water quality concerns and protection strategies but has only an advisory role with no regulatory authority. CUSP has been involved in coordinating post fire recovery efforts in areas such as the 2002 Hayman Fire, the 2012 Waldo Canyon Fire and other smaller fires throughout the watershed. CUSP has received the prestigious National Fire Plan 2003 Award for their work and have been recognized for “excellence in rehabilitation and restoration as well as their excellence in community assistance.” As of 2020, CUSP has 14 full time employees and shares several employees with Coalitions and Collaboratives.

CUSP advisory Board is comprised of individuals from county governments, nonprofit organizations, water conservancy districts, city utility agencies and interested private individuals with no affiliation. The main function of CUSP, as outlined in their Memorandum of

Understanding, is to:

1. Protect water quality in the Upper South Platte River and its tributaries to support beneficial uses, which could include drinking water supply and cold-water fisheries
2. Sustain the productivity and diversity of the ecological systems within the watershed
3. Address water quality impacts related to water quantity management
4. Manage nonpoint pollutant sources including grazing, forestry, transportation corridors, mining, erosion, and septic systems
5. Minimize impacts of disastrous events, such as the Buffalo Creek Fire

CUSP updated its 10-year strategic plan in 2016. CUSP crews are involved in pre-fire forestry mitigation, post fire recovery, river/stream restoration, water quality monitoring, sediment control projects, trail work, environmental education, invasive species control and eradication and forest ecological restoration. More information can be found at: www.cusp.ws

9.4. Other Groups

9.4.1. Water Conservancy Districts

The Headwaters Authority of the South Platte now exists as a joint organization between CCWCD and USPWCD. Their website can be found at: <http://haspwater.com/> The Upper South Platte Water Conservancy District (USPWCD) and the Center of Colorado Water Conservancy District (CCWCD) are water districts servicing Park County and portions of Teller, Douglas, Jefferson and Clear Creek counties. The two districts joined together to form the Headwater Authority of the South Platte (HASP). HASP operates a water rights enterprise through which it makes augmentation water available for sale to customers throughout the Districts' service areas. HASP has two programs - a current water sales program and the Blanket Augmentation Plan.

10. Conclusions & Recommendations

10.1. Conclusions

The most prevalent impacts identified in the watershed are erosion, wildfires, livestock, and mine runoff. Based on a review of the South Platte and Upper South Platte Watersheds:

- Historic and current water quality problems are primarily a result of legacy mining activities, and future water quality problems are expected to reflect the shift in the economic base from mining to tourism and agriculture.
- Water quality information is improving, and problem areas are being identified and mitigated. If water quality information were more complete, problems in the watershed could be better understood and dealt with more effectively.
- The priority issues to address are agriculture, fire, land use and development, mining, recreation, transportation, water rights, water system operations, and weeds.
- The low-priority issues are solid/hazardous waste, spills/illegal dumps, stormwater runoff and underground storage tanks.
- Land ownership within the watershed is primarily by federal and state agencies. The Forest Service is the largest land manager, overseeing 51% of the land.
- Most of the growth has occurred and is expected to continue in the unincorporated portions of Park County.
- Population increases in Park County and Front Range communities caused an increase in demand for groundwater and surface water, which could have future impacts on water quality.
- The existing capacity at most wastewater treatment plants is sufficient to meet needs through at least 2025.
- Drinking water quality in Park County is good except for some minor exceptions.

10.2. Recommendations

The Upper South Platte Watershed needs to see more collaboration between federal agencies, state agencies, conservation districts, county agencies and non-profits. No one entity has all the answers and we must be willing to sit together and have professional discussions to move projects forward and to protect communities, habitat, and water quality.

The other need is simply education to landowners and communities. It is important understand the pre and post effects of fires on forest health and water quality. And understand the impacts that recreation can have on sediment that winds up in waterways and impacts aquatic habitats.

The recommendations listed below require funding opportunities such as grants and contributions from other organizations.

10.3. Table: Summary of Recommendations

Location	Primary Problems	Recommendations ^{1,2}
Middle Fork of the South Platte	Historic mining activities; Potential Recreational and Urban and Construction impacts.	Implementation of Mining BMPs (includes possible reclamation work); Water quality data collection upstream and around Alma.
South Mosquito Creek and Mosquito Creek	Historic mining - Montgomery Mill, London Mill, London Extension Tunnel, Buckskin Gulch	Mining BMPs; TMDL developed and continued to be implemented.
Trout Creek	Nutrients	Assess nutrient concerns
Mainstem of the South Platte	Hayman wildfire damage; Heavily logged; Erosion (extensive work was conducted to address these concerns).	Evaluate effects of fire on existing TMDL; Fire restoration; Agriculture BMPs; further research into erosion problems in sheep creek; Public outreach.
Tarryall Creek	Poor agriculture practices	Implementation of Agriculture BMPs; Public outreach; Conservation easements were developed over past several years; Collection of suspended sediment data.
North Fork of the South Platte	Acid mine drainage especially from abandoned/inactive mines around Geneva Creek; movement of tailings	Mining BMPs (includes possible reclamation work).
Badger Creek	Poor grazing practices	Outreach efforts with landowners; Agriculture BMPs;
Three Mile Creek	Poor Grazing Practices	Agriculture BMPs; outreach efforts
Peatlands	Peat mining	Seek funding for identification; further studies; monitoring;
Notes: ¹ Possible mining BMPs, listed in the current Colorado NPS Management Program are through Hydrologic Controls such as Diversion ditches, mine water removal and consolidation of stream diversions, bulkhead seals, and revegetation; and through passive treatment such as settling ponds, sulfate reducing wetlands, aeration, dilution, and land application. ² Possible Agriculture BMPs, listed in the 2012 Colorado NPS Management Program are soil stabilization of grazing lands, grazing management, soil stabilization in riparian areas, irrigation water management and nutrient management.		

10.4. Total Maximum Daily Loads (TMDLs)

Assist in the review and evaluation of TMDLs for stream sections currently listed on the 303d

list and implementation of developed TMDLs .

The TMDL previously developed for the mainstem of the South Platte should be reviewed for fire impacts since it was completed right before the Hayman Fire.

10.5. Surface Water and Groundwater

Continue monitoring local phosphorous loading. This includes future monitoring and sampling at the East Portal of Roberts Tunnel for phosphorous.

Work with the USGS to update the previous streamflow and water quality data report which analyzed water quality conditions based on 1962 - 1998 data (Water Resource Investigation Report 01-4034).

Develop a report to petition the EPA to designate the South Park Aquifer as a source water protection area according to <https://www.epa.gov/dwssa/guidance-petitioning-sole-source-aquifer-ssa-designation>. The report should be based on the EPA Sole Source Aquifer Designation Petitioner Guidance, which provides procedures and criteria for proposing aquifer boundaries, determining whether an aquifer is the sole or principal source of drinking water, and evaluating alternative sources of drinking water.

Work with the USGS, Park County, and interested stakeholders to improve the existing surface water- and groundwater-monitoring network. The surface water monitoring program should evaluate:

- Presence of natural background levels and pollutants related to historic mining activities in the Middle Fork and its tributaries and the North Fork and its tributaries, including a location at the point of exit from Roberts Tunnel at the North Fork of the South Platte;
- Presence of dissolved uranium, radium 221, radium 228;
- Future locations for water quality monitoring stations.

Develop baseline groundwater quality conditions prior to any oil and gas drilling or uranium mining.

Assess the need to develop well-head protection zones and plans for residential areas that rely on groundwater as a source of drinking water. This should be based on development patterns and a review of the USGS Groundwater Report (2007). Areas that should be considered in this

analysis are the groundwater supply intake for Camp ID-RA-HA-JE, Campground of the Rockies Association, Deer Creek Elementary School, Platte Canyon High School, Florissant Fossil Beds National Monument, Town of Fairplay, and areas that rely on the South Park aquifer. This should include a review of the completed CDPHE Source Water Assessment Protection Plans.

Assess available data to evaluate the need for mitigation systems to reduce radon levels.

10.6. Agriculture

Continue to work with the ranching community to develop sustainable practices, and planning and implementation, including developing fencing for riparian areas.

Implement BMPs to reduce water quality impact from agriculture activities.

10.7. Suspended Sediment

Collect additional suspended sediment data on tributaries to the South Platte River and North Fork of the South Platte River. This will provide critical information to evaluate those segments currently listed on the 2018 303(d) List and/or Monitoring and Evaluation List.

Mechanisms such as BMPs should be researched to address current and potential future sources of sediment in areas identified in the 208 Plan: Badger Creek; Sheep Creek; stream corridors on BLM and State Land Board property where there are grazing allotments; and South Fork, Middle Fork, and North Fork of the South Platte.

10.8. Silviculture

Controlled burns should be used to clear excessive ground debris, encourage new growth, and decrease the severity of wildfires. Controlled burns also decrease erosion and protect water quality. These actions are especially critical given the number of wildfires that have occurred over the past several years.

Implement forest management BMPs (CNPSC, 2002), such as proper timber harvesting, woodland thinning or pruning for tree health, and recreation area management strategies. Work with the state and federal forest service agencies and universities to integrate research, monitoring, and management.

Continue watershed restoration efforts in areas affected by the Schooner and Hayman fires.

10.9. Peatlands

Investigations should be conducted to determine the effects of mining on peatlands and how it effects downstream and reservoir water quality. Information should also be collected on hydrologic behavior, monitoring, preservation, and protection.

10.10. Mining

The impact of the mining activities and reclamation work east of Alma should be evaluated to determine what, if any, additional BMPs or reclamation strategies might be needed. Similarly, other stretches of the Middle Fork of the South Platte are impacted by legacy or current mining activities should have appropriate entities identified in order to evaluate the needs and implement appropriate BMPs and reclamation efforts.

10.11. Transportation

Identify BMPs for proposed new road construction and maintenance, determine if existing roads have water quality impacts, and develop mitigation strategies.

Minimize the use of deicers such as methylene chloride except where necessary, and minimize the use of sand except at locations where it is absolutely necessary for safety concerns.

10.12. Stormwater Runoff

Although a point source issue managed under MS4 stormwater permit requirements, minimizing the effects of stormwater runoff passing through municipal, commercial, and residential development areas and, if necessary, implement BMPs to mitigate adverse effects before runoff discharges into local streams. This is especially critical in the more urban areas such as Fairplay, Alma, Bailey, etc. The promulgation of NPDES Phase II regulations currently does not affect Park or Teller Counties but could in the future.

10.13. Onsite Wastewater Treatment Systems (OWTS)

Produce and mail educational material to new homeowners on the proper operation and maintenance of septic systems and on opportunities to be involved in groundwater monitoring.

Encourage cluster development and the strategic placement of residential structures in order to protect wetlands and wildlife/habitat corridors.

Data from the USGS (2007) indicates OWTS density and year of installation are related to groundwater quality. An electronic database should be developed to track OWTS installation

and maintenance that contains installation date, maintenance, problems/issues, and soil stratigraphy. This information, along with recommendations made through the CDPHE OWTS Working Groups, should be assessed to determine if it is reflected in current county OWTS regulations.

10.14. Water Quality Management Association

Formation of a WQMA is still recommended in the South Platte River Basin. The specific responsibilities of the WQMA and the participants are outlined in the 208 Plan. The CUSP is actively involved in water quality concerns and protection strategies but has no regulatory authority. A strategic plan developed by the CUSP outlines the critical importance of addressing the current and future problems and issues in the watershed.

The formation of the South Platte WQMA should be a cooperative effort based on the overlapping jurisdictions within the region. This could be accomplished through the coordinated efforts of the Upper South Platte Water Conservancy District, the Central Colorado Water Conservancy District, and the Park County Land and Water Trust Fund Board. The Trust Fund Board is a seven-member advisory to the County Commissioners. It was created in 1997 and is charged with the preservation, protection, acquisition, improvement, and maintenance of water resources in Park County. The South Platte WQMA could consist of the entities listed below and act as the designated management agency for the watershed. PPACG should assist in the development and support of the water quality management agency and provide technical and administrative assistance to the management agency when formed.

The proposed South Platte WQMA should include:

- Park County Board of Commissioners
- Teller County Board of Commissioners
- Upper South Platte Water Conservancy District
- Central Colorado Water Conservancy District
- Town of Fairplay
- Fairplay Sanitation District
- Town of Alma
- Bailey Water and Sanitation District
- Will-O-Wisp Metropolitan District

- City of Woodland Park
- Florissant Sanitation District
- Divide Water & Sanitation District
- Teller County Water and Sanitation District
- Federal Land Management Agencies
- State Land Board

The WQMA should assume the following responsibilities and include the following functions:

- Assure point and nonpoint water quality concerns in the watershed are being evaluated;
- Assure water quality planning in new developments in the watershed is consistent with the 208 Water Quality Management Plan;
- Recommend or encourage consolidation of wastewater facilities and operation and maintenance functions among entities in the watershed where appropriate;
- Work on water quality planning issues such as source water protection programs and Total Maximum Daily Load (TMDL) allocation studies;
- Review proposed changes to the existing stream-monitoring network;
- Review and comment on discharge permits;
- Develop a fee structure to ensure participation in water-quality-related projects such as new or additional monitoring stations.

10.15. Coalition of Upper South Platte (CUSP)

Forestry, water quality monitoring, river restoration and forest ecological restoration work are never ending. There is more than enough work in the Upper South Platte Watershed to sustain CUSP for many years to come. The sticking point as with any non-profit is funding. CUSP is grant funded and must continually seek grant funding on an annual basis and there is a lot of competition for grant funding. The future answer lies in a large endowment that will allow us to continue our work and not always have to work about funding. However, this type of funding mechanism is not readily available.

11. Upper Arkansas Watershed

11.1. Introduction and Overview

The Upper Arkansas Watershed is the single largest watershed in the Arkansas River Basin and only a fraction, about 15%, is within the Pikes Peak region, mostly in Teller County. Section 7.0 will focus on the Teller County portion of the Upper Arkansas Watershed.

The Upper Arkansas Watershed encompasses a total of six counties: Teller, Park, El Paso, Custer, Fremont, and Pueblo, with most of the watershed located within Fremont and Pueblo counties. The Upper Arkansas Area Council of Governments (UACOG) is a voluntary coalition collaborating across its region for years to conduct regional water quality management planning. UACOG covers the four counties of Lake, Chaffee, Fremont, and Custer, located in portions of the Upper Arkansas Headwaters and Upper Arkansas Watersheds; and the Pueblo Area Council of Governments (PACOG) covers Pueblo County, located in the Upper and Middle Arkansas Watersheds.

UACOG: <http://www.uaacog.com/home.html>

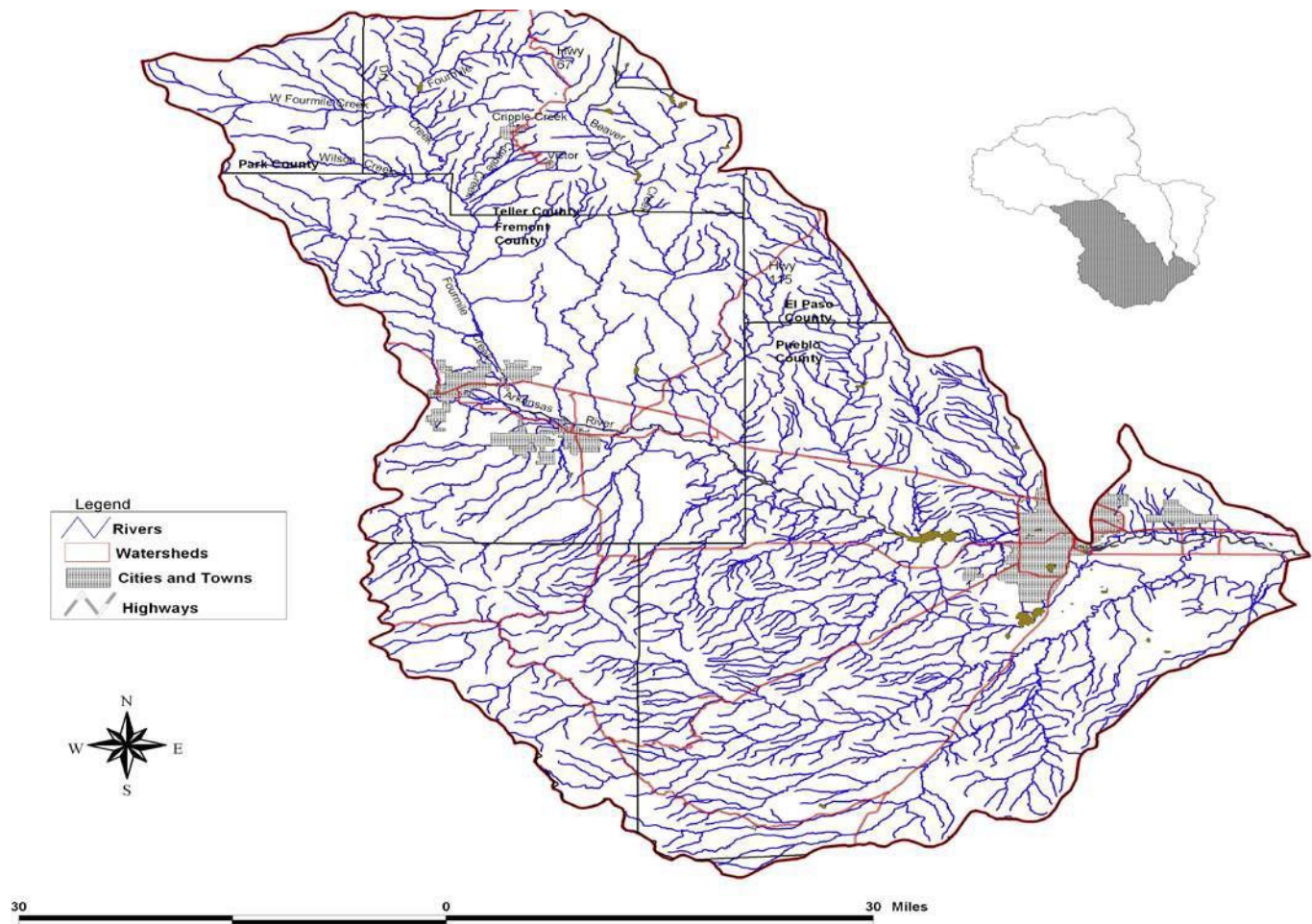
PACOG: <https://county.pueblo.org/pacog/pueblo-area-council-governments-home>

The watershed consists of high narrow valleys that contain mountainous topography characterized by many steep slopes and canyons. There is a natural divide from east to west that runs through Teller County; the east side flows to the South Platte River and the west side flows to the Arkansas River. Highway 67 is the main highway connecting Woodland Park to Cripple Creek. Within Teller County, most of the land in the southeastern to middle portions is privately owned; land along the southwestern portion is owned by the U.S. Forest Service. Historic mining operations conducted in this region were on the privately-owned land.

11.2. Land Use

Land use primarily consists of urban and suburban development, grazing, recreation, and mining. Historically, gold mining had a major impact on characterizing this region. Most of the mining took place in the mid to late 1800s, although Cripple Creek and Victor still have an active gold mining operation. Most of the historic mines are located in what is now Cripple Creek and Victor's current permitted boundary area. Gold mining is expected to continue to economically drive the county and the communities of Cripple Creek and Victor. Near Cripple Creek and Victor, there are interpretive sites and trails that show and explain the 1890s gold mines. Recreational uses of the land include motorized and nonmotorized vehicles.

11.3. Figure: Upper Arkansas Watershed Reference Map



11.4. Population and Socioeconomic Characteristics

DOLA projects 25,630 people living in Teller County by 2020. About 8,700 people live in the Upper Arkansas Watershed. Of the 8,700 residents, Cripple Creek and Victor are the two largest municipalities within the Upper Arkansas Watershed and have a combined population of about 1,600 people (DOLA, 2010).

Teller County faces the challenges brought about by rapid growth and the demand to preserve the natural habitat that continues to draw residents and tourism to the area as it has for over 100 years. It is expected that tourism, retirees, and more basic industries will continue to increase the population of Teller County. However, limitations such as adequate water supplies remain. High demands and build-out of small lots are apparent in Cripple Creek Estates, Colorado Mountain Estates, and Rainbow Valley.

11.5. Characterization of Watershed Issues Water quality issues primarily revolve around:

- Expansion of Newmont Mining Corporation, Cripple Creek & Victor Gold Mining Company (CC&V).
- Groundwater supply and water quality issues are a problem as identified by TST (2001) (primary causes are from septic systems).
- Impacts from population growth.
- Stormwater runoff, which has not been a major problem in either Cripple Creek or Victor, but as these cities grow, a stormwater program may need to be developed.

12. Water Quality Characterization

Surface water and groundwater quality degradation are important to examine because both are sources of drinking water for the county and municipalities. Most residents living outside an urban area rely on groundwater from wells, while the primary source of drinking water for residents within Cripple Creek and Victor are central distribution systems that rely on surface water.

12.1. Surface Water

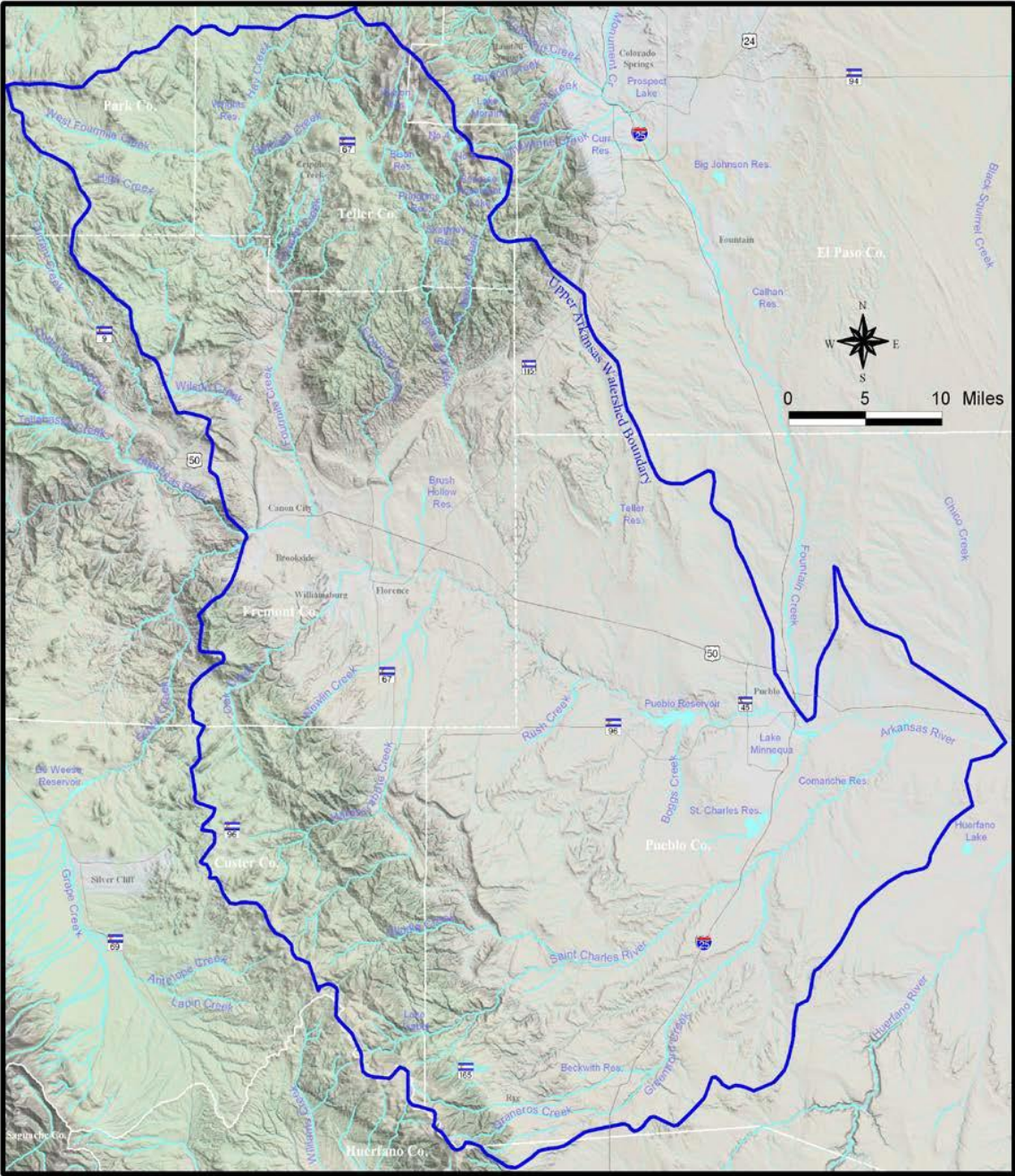
12.1.1. Water-Quality-Impaired Stream Segments

There are no segments listed on the 2018 303d list and on the 303d Monitoring & Evaluation list for the Teller County portion of the Upper Arkansas Watershed.

12.2. 2018 303d list and 303d Monitoring and Evaluation List

Segment	Segment Description	Affection Portion	Monitoring Evaluation List	303d List
COARUA14d	All tributaries to the Arkansas River, including wetlands, which are not on National Forest lands, from the Chaffee/Fremont County line to the inlet to Pueblo Reservoir, except for specific listings in segments 14a, 14c and 15-27.	Turkey Creek above the unnamed tributary that drains Mount Pittsburg (38.615, -104.903)	Total Phosphorus	
COARUA15	Mainstem of Grape Creek, including all tributaries and wetlands, from the source to the outlet of De Weese Reservoir, except for specific listings in segment 25. Mainstems of Texas, Badger, Hayden, Hamilton, Stout, and Big Cottonwood Creeks, including all tributaries and wetlands, from their sources to their confluences with the Arkansas River. Mainstem of Newlin Creek from the National Forest boundary to the City of Florence water diversion.	Grape Creek and its tributaries from Antelope Creek to Deweese Reservoir	<i>E.coli</i> Macroinvertebrates Temperature	Arsenic (Total)
COARUA20	Fourmile Creek and tributaries, Cripple Creek to Arkansas River	North Fork Wilson Creek below Independence Mine	Arsenic (Total) Selenium (Dissolved)	

12.3. Figure: Upper Arkansas Watershed Stream Locations



13. Point Source Dischargers

13.1. Overview

The Teller County portion of the watershed has two municipal dischargers and one industrial discharger shown in Tables 13.2 and 13.3 and Figure 12.3.

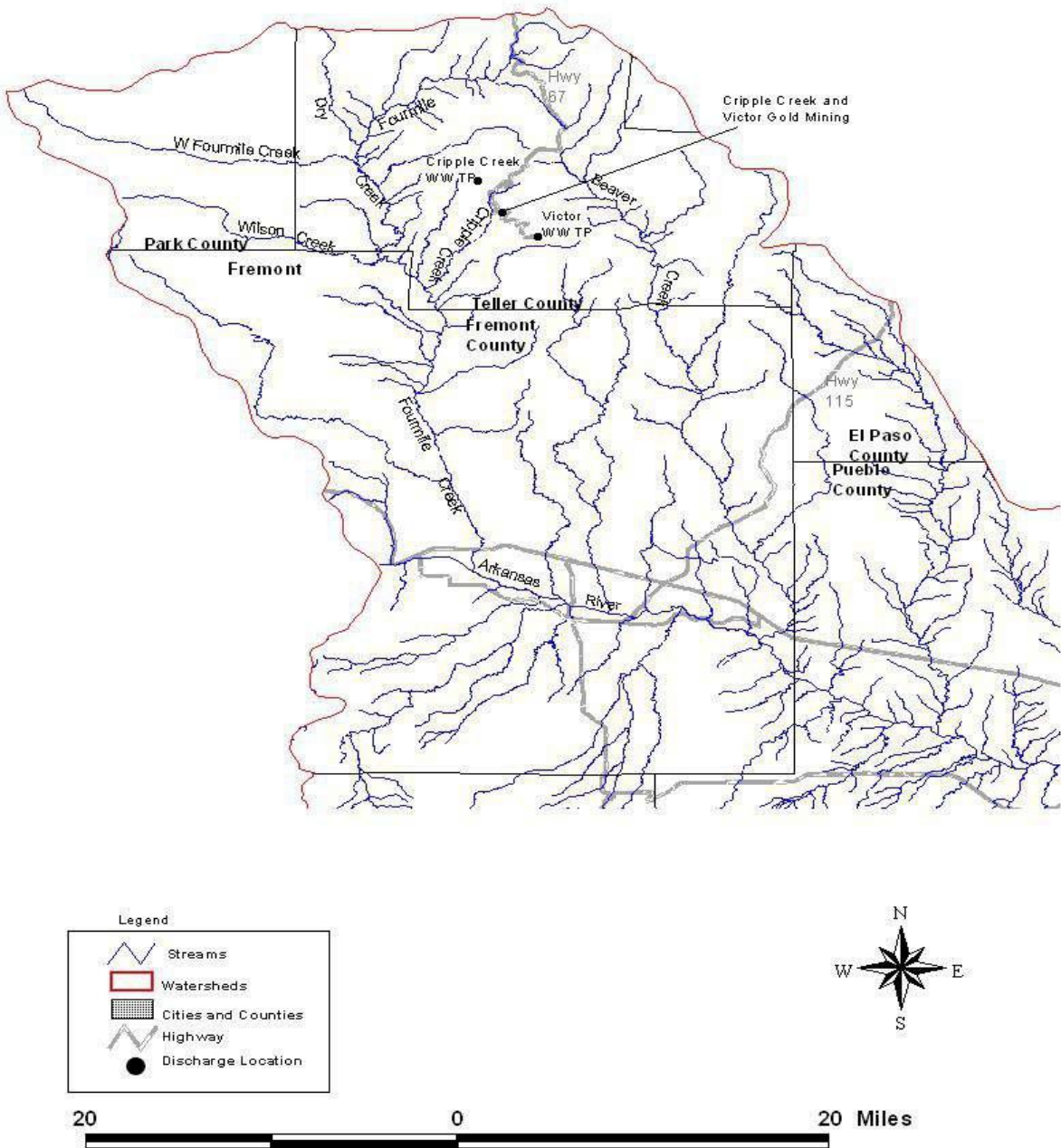
13.2. Upper Arkansas Watershed Municipal Discharge Facilities

Discharge	Permit No.	Discharge Location	Design Capacity (MGD)	Existing Load (MGD)	Expiration Date
City of Cripple Creek	CO-0039900	Cripple Creek, southern edge of town	1.0	0.41	7/31/2019
City of Victor	CO-0024201	Intermittent trib. of Wilson Creek at southern edge of Victor	0.087	0.049	11/24/2024

13.3. Upper Arkansas Watershed Industrial Discharge Facilities

Discharge	Permit No.	Discharge Location	Design Capacity (MGD)	Expiration Date
Cripple Creek and Victor Gold Mining	CO-0043648	Arequa Gulch	2.10	4/30/2022

13.4. Upper Arkansas Watershed Point Source Discharge Locations



13.5. Future Needs Assessment

13.5.1. Cities of Cripple Creek and Victor

The City of Cripple Creek has made improvements to their water main systems including a water main replacement on Bennett Avenue in 2019 and on Bison Avenue in 2014. The City sees a need for making improvements to their system regarding storage, lake dredging, and overall needed system improvements. These improvements include older water system lines and water system mains need to be upgraded to maintain operations at an adequate capacity along with needs to increase storage capacity. There is also a need to have a lake dredged for sediment due to many years of silt run off and build up in the lake serving the water district.

Growth in the City of Victor is expected to be minimal, and no new construction is expected to be necessary. Future needs include a new UV Disinfection System; two aluminum covers for the biosolids; and headworks screen. The wastewater treatment plant will consist of two aeration basins constructed in the former lagoons, referred to as cell no. 2 and cell no. 3. These aeration basins, no. 1 and no. 2, are equipped with submerged fine- bubble-diffused air operating in an extended aeration type of process. The design and operation of the activated sludge system is to accomplish a significant degree of nitrification in order to meet very stringent ammonia effluent limits for the plant. The city plans to cooperate with the Pikes Peak Mining Company for beneficial use of the biosolids in reclamation of disturbed areas in the mining district.

13.5.2. Cripple Creek and Victor Gold Mining Company

The mine life extension was approved in 2008 and includes extending the mining areas to the north and east to increase the mine life an additional four years. In 2015, the mine was purchased from Newmont Mining Company, along with the land privately owned. The mine is zoned by Teller County for mining activities, and within the current permit boundaries established by State of Colorado and Teller County permits. Information regarding the mine can be found at <https://www.newmontgoldcorp.com/>

13.6. Industrial

The only industrial discharge facility in the Teller County portion of the watershed is the Cripple Creek and Victor Gold Mining Company (CC&V).

13.6.1. The Cripple Creek and Victor Gold Mining Company

Background

The Cresson Project water quality is regulated by two separate agencies.

- Groundwater is regulated by the Division of Reclamation, Mining, and Safety (DRMS), with permits filed for each of the monitoring systems (groundwater wells) with the State Engineer's Office.
- Surface Water and Stormwater are regulated by the Water Quality Control Division (WQCD).

Required groundwater monitoring and specific parameters to be monitored are approved by the DRMS, and groundwater monitoring results are reported to the DRMS on a quarterly basis. Inspection of that program is completed by the DRMS.

In addition, there are four active WQCD permits as part of the Cresson Project: Permit CO-0024562 (Carlton Tunnel), Permit CO-0043648 (Arequa Gulch), Permit CO-0046540 (Fourmile Creek Springs), and Permit COR-040000 (stormwater discharges are controlled through the general permit). Monitoring and specific parameters to be monitored as part of the Cresson Project are approved by the WQCD.

Currently, monitoring results for CO-0024562, CO-0043648, and CO-0046540 are reported to the WQCD on a monthly basis. Inspection of those permits is completed by the WQCD on an annual basis. There two required annual inspections of the facilities by CC&V and an annual inspection completed by a third-party consultant. All these results are included in the annual report submitted to the WQCD. DRMS also includes an inspection of the stormwater features within the active mine area when at the site and at least once a year reviews of the stormwater control features external to the active mine area, with results included within the inspection reports completed by DRMS.

The Cripple Creek and Victor (CC&V) Gold Mine, Colorado's largest gold mine, discharges (CO-0043648) to Arequa Gulch, tributary to Cripple Creek (Upper Arkansas River Segment 2a). In addition to the discharge points included in permit CO-0043648, there are several other types of discharges and permits associated with the Cripple Creek and Victor Gold Mining operation. Most of the historic mines are not located within what is not CC&V's permit boundary area.

Several historic drainage tunnels traverse the pit area at depths of 1,000 to 3,000 feet below

the ground surface. Discharge from the Carlton tunnel is addressed through the Carlton Tunnel permit. The Roosevelt Tunnel is not owned by CC&V, and discharge from the Roosevelt Tunnel is regulated separately by CDPHE-WQCD. Other historic drainage tunnels in the mining district are located at elevations higher than these two tunnels and are generally dry.

13.7. Municipal

There are two municipal discharge facilities located within the Upper Arkansas Watershed portion of Teller County: Cripple Creek and Victor.

13.7.1. City of Cripple Creek

The City of Cripple Creek WWTP has a rated capacity of 1.0 mgd and is currently loading at approximately 0.4 mgd. The maximum hydraulic capacity is 1.35 mgd with further potential to upgrade to 1.75 mgd. The facility discharges to Cripple Creek (Upper Arkansas River Segment 21). The expansion and upgrading to the city's wastewater treatment plant was required due to changes in the economic development of the community. Since the legalization of limited stakes gambling within the corporate limits of Cripple Creek, a significant amount of commercial development has occurred.

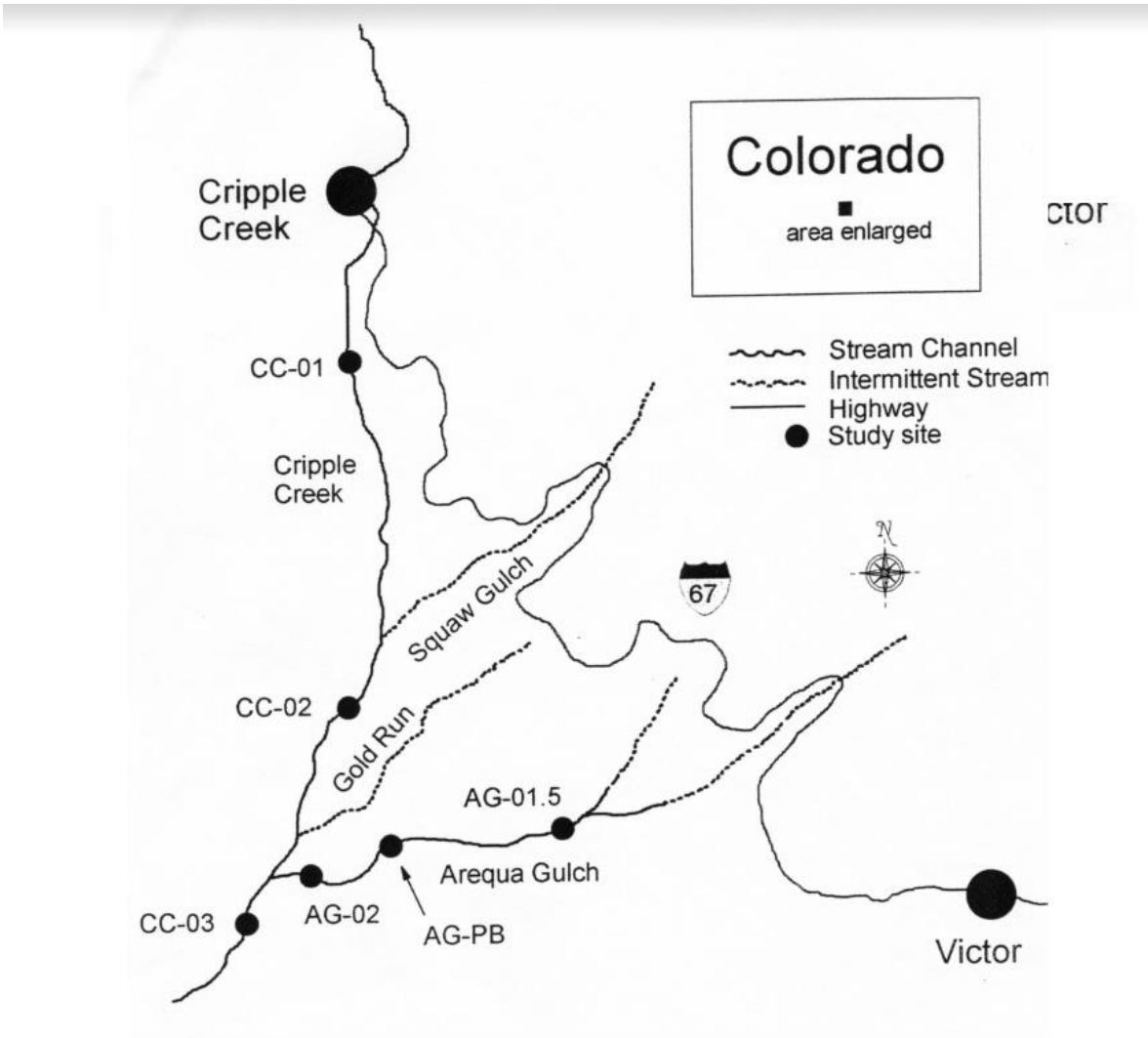
13.7.2. City of Victor

The City of Victor's WWTP was designed for a maximum average daily flow of 0.087 mgd. The plant's efficiency is expected to be 91% for BOD and TSS removal. The flow first travels through a comminutor that grinds rags into small pieces. It then travels through a grit chamber that removes 95% of the grit larger than 59 mesh and 85% of the grit larger than 70 mesh. Sludge then enters the extended aeration basin where it is mixed with return-activated sludge to stabilize the BOD. From there it flows to the secondary or final clarifier, with a surface area of 380 square feet. Return sludge is handled with one of two screw pumps that run continuously, and waste-activated sludge is drawn from the RAS pipeline with a positive displacement diaphragm pump controlled by a timer set by the operator. The clarifier effluent flows through an ultraviolet radiation tank for disinfection and discharge to an intermittent tributary of Wilson Creek (Upper Arkansas River Segment 23).

13.8. Major Point Source Service Area Maps

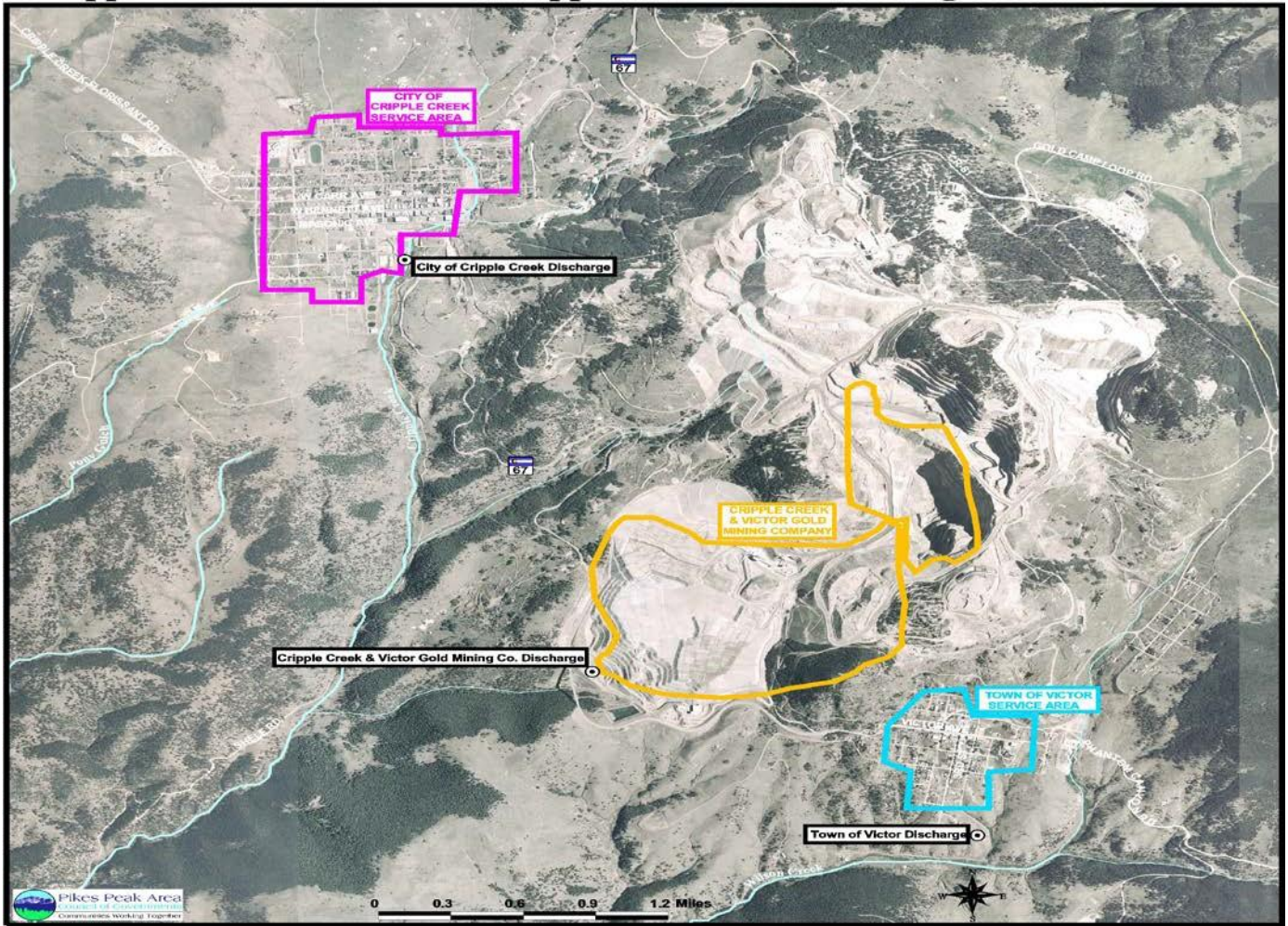
Service area maps show projected service area boundaries for each facility previously described. The background of these maps is Google Earth satellite imagery, which was last updated in 2005. Major point source discharge locations are shown on the service area maps.

13.9. Cripple Creek and Victor Gold Mining Monitoring Stations



13.10. Cripple Creek and Victor Service Area and Cripple Creek and Victor Mining Company

Cripple Creek, Victor, & the Cripple Creek/Victor Mining Co. Service Areas



13.11. Resource Extraction

The primary resource extraction area within this watershed is the Cripple Creek and Victor Gold Mining operation. Current operations focus on the Cresson Mine, an active mine that produces gold from the Cresson deposit and is located within the heart of the Cripple Creek Mining District. By 1990, CC&V discovered a reserve of over 81 metric tons of gold contained within the Cresson deposit. In 2002, CC&V completed an expansion of the Cresson Mine that included expansion of the size and depth and two additional surface mines. Other main features of this project are the zero-discharge Valley Leach Facility (VLF) (constructed in the Arequa Gulch drainage), the Minerals Beneficiation Facility and Process Buildings, the Arequa Gulch Overburden Storage Area (constructed upstream of the VLF), and the Squaw Gulch Overburden Storage Area (located at the headwaters of Squaw Gulch).

The Division of Reclamation, Mining and Safety is responsible for the protection of groundwater within the mine site area and, in cooperation with the permittee, has developed a groundwater monitoring program intended to control any groundwater contamination that might result from this operation.

CC&V reclaims and revegetates areas as soon as mining activities are completed. Reclamation is conducted concurrently with mining rather than leaving all reclamation until the end of the mine life. To date, reclamation efforts have focused on the Squaw Gulch Overburden Storage reclamation above Cripple Creek, the Arequa Gulch Overburden Storage Area reclamation, and reclamation of historically mined areas around the property.

Historic mining and abandoned mine drainage (AMD) activities in Teller County have impacted water quality and are a potential threat to human and ecosystem health. There are many abandoned hard rock mines on public and private property in Teller County. Some of these are identified in the Colorado Geological Survey Abandoned Mine Land Inventory Project:

<http://coloradogeologicalsurvey.org/water/abandoned-mine-land/united-states-forest-hazard-abandoned-mine-land-inventory-project/>

The second highest priority watershed impacted by abandoned mines on public lands includes the Upper Arkansas Watershed (this includes several mines located in the Upper Arkansas Watershed outside of Teller County). These watersheds were prioritized by assessment undertaken by the WQCD in 2000 and 2004. A list of some of the historic mines in Teller County is available at <http://www.victorcolorado.com/stcfnnews.htm>.

14. Water Quality Management Associations and Watershed- Based Groups

14.1. Wastewater Operating Agencies

The following organizations are recognized as wastewater operating agencies within the Upper Arkansas Watershed. These agencies are responsible for controlling all aspects of the collection, treatment, and discharge of sewage or industrial concern within their company's sphere of operation.

- Cripple Creek and Victor Gold Mining
- City of Cripple Creek
- City of Victor

14.2. Management Agencies/Associations

14.2.1. Teller County Water Quality Management Association

The Teller County Water Quality Management Association is the only existing WQMA within the Upper Arkansas Watershed. Members of this association are within Teller County and primarily in the Upper Arkansas Watershed. Members are from the southern portion (Cripple Creek, Victor, Cripple Creek & Victor Gold Mining Company) and western portion (City of Divide) of Teller County. Other organizations represented include water and sanitation districts, Teller County Health Department, and the Natural Resources Conservation Service.

The Teller County WQMA was formed in 1977 under a Joint Exercise of Powers agreement between the City of Victor, City of Woodland Park, and Teller County. The association continues to meet on an as-needed basis. Because this WQMA covers the portion of the Upper Arkansas Watershed in the Pikes Peak region, no other WQMAs are recommended.

15. Conclusions and Recommendations

15.1. Conclusions

Teller County represents a small portion of the Upper Arkansas Watershed and is primarily rural. Conclusions drawn from a review of the Upper Arkansas Watershed include the following:

- Expansion of the Cripple Creek and Victor Gold Mining operation will require water quality monitoring to determine continued permit compliance.
- OWTs in Teller County represent both a near-term and a long-term threat to groundwater quality.
- Groundwater is the major source of drinking water for the county, and water quality degradation is a major concern.
- Based on historical trends, most of the growth is expected to occur in the unincorporated portions of Teller County.
- Due to the presence of large areas of national forest and state parks, development in certain areas will be negligible.
- Activities potentially affecting water quality include unmanaged historic mine sites.

15.2. Recommendations

These recommendations are specific to the Upper Arkansas Watershed; general recommendations are listed in Section 3, Policy Evaluation.

15.2.1. Groundwater Quality Monitoring

Conduct a comprehensive groundwater quality study and develop a countywide, comprehensive groundwater protection plan.

15.2.2. Onsite Wastewater Treatment Systems

Develop a program for testing and assessing existing septic systems to determine if existing systems are working adequately, and develop a county-wide database that contains the age, design, location, and date of last servicing for the systems.

16. Fountain Creek Watershed

16.1. Introduction and Overview

The Fountain Creek Watershed is about 930 square miles and is located in the western portion of El Paso County and the northwestern portion of Pueblo County. This area is classified as a semi-arid environment. The two primary creeks in the watershed are Monument Creek and Fountain Creek, which flow into the Arkansas River. About 85% of the drinking water (supplied by Colorado Springs Utilities) is from transbasin diversions. The creek and alluvial aquifer wells tributary to Monument Creek and Fountain Creek provide a small source of drinking water for Colorado Springs and are a source of irrigation for more than 100 farmers and ranchers. Fountain Creek alluvial wells provide more than half of the water supply to Security, Widefield, Fountain, and Stratmoor Hills.

The Fountain Creek Watershed is one of numerous watersheds within the Arkansas River Basin and contains two of the largest metropolitan areas along the Front Range: Colorado Springs and Pueblo (DOLA, 2010).

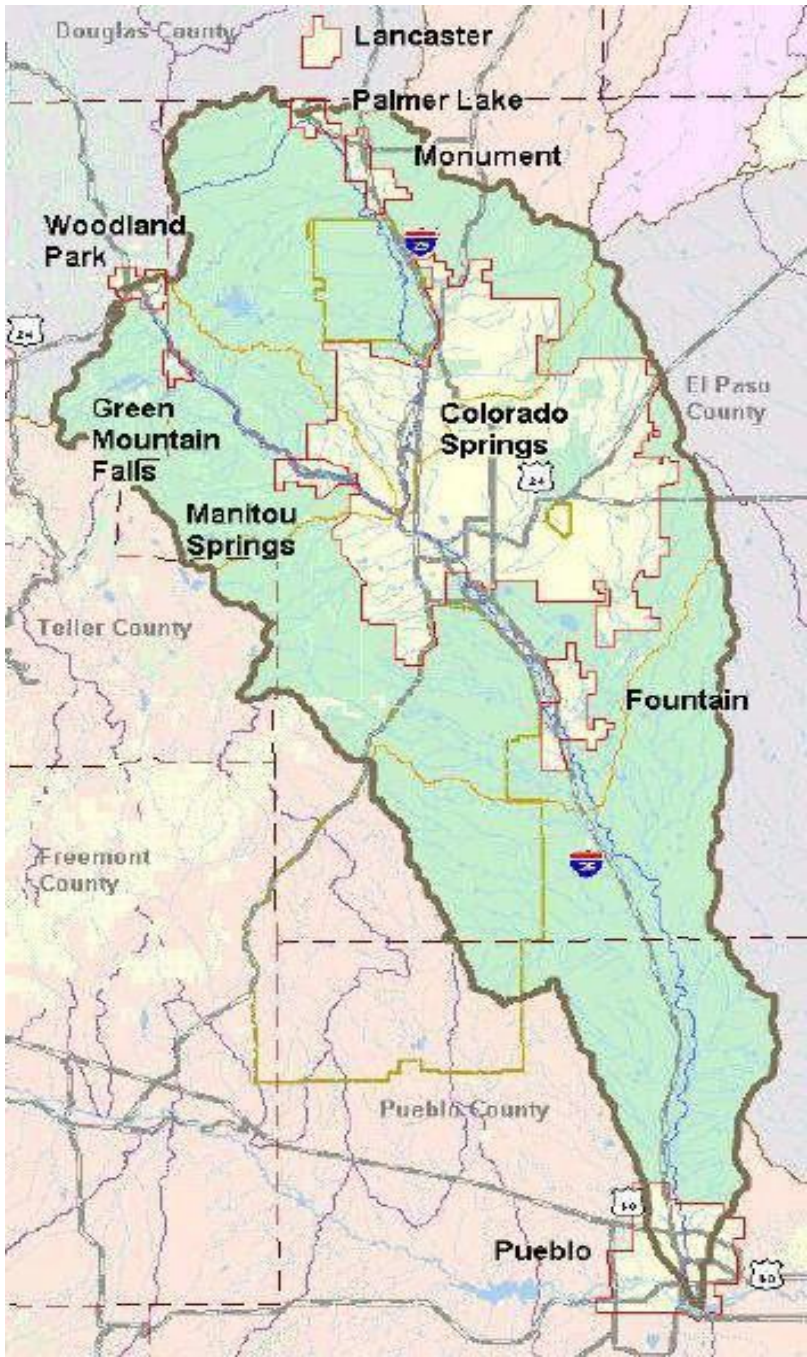
16.1.1. Land Use

The Fountain Creek Watershed reflects a variety of possible land uses: residential (high, medium, and low density), commercial and office, industrial, parks and open space, schools and institutions, agricultural, and undeveloped land. Most of the agricultural land is located along the lower portion of Fountain Creek. The amount of residential and commercial development is increasing in the watershed. Residential and commercial development in unincorporated El Paso County has undergone large increases between 2002 and the present.

16.1.2. Population and Socioeconomic Characteristics

Anticipated growth in the region reinforces the importance of not only understanding the correlation between population growth and watershed health but also formulating a plan to minimize the adverse effects of future growth. Many critical issues from transbasin diversion rates to impervious cover and resulting stormwater runoff rates are reflections of regional population dynamics. Population projections serve as the basis for determining the amount of water necessary to meet the forecasted demand for 20 to 40 years.

16.2. Figure: Fountain Creek Watershed Reference Map



16.3. Characterization of Watershed Issues

The primary issues to address in the Fountain Creek Watershed are water quality, erosion, sedimentation, and flooding. However, the importance of each of these issues is different throughout the watershed and is based upon the different physical processes operating in the watershed, the management practices in use, and the technical strategies being applied.

It has become evident that as the Fountain Creek Watershed becomes increasingly urbanized, problems and issues associated with the main streams draining the basin have become more common. Erosion, sedimentation, and flooding problems have highlighted the need to understand the consequences of development activities in the watershed.

These activities alter the basic parameters most affecting channel changes and controlling erosion and sedimentation problems in the Fountain Creek Watershed, all of which are interrelated, include:

- Increased baseflow discharge;
- Increased sediment supply and transport;
- Floodplain encroachment by development;
- Channel realignment; and
- Channel bank protection and grade control.

16.4. Overview of Watershed Activities

Several ongoing efforts at technical and policy levels are trying to address the problems and issues within the Fountain Creek Watershed. The Fountain Creek Watershed Greenway and Flood Control District was created in 2009 by the Colorado State Legislature. The district is discussed further in Section 8.5 (Water Quality Management Associations and Watershed Planning Groups). More information on the Fountain Creek Watershed Greenway and Flood Control District and their projects can be found at: <http://www.fountain-crk.org>

Some of the primary activities since the last update of the 208 Plan are:

- Barr Farm Channel Restoration Project

The Project is located on Fountain Creek in northern Pueblo County along Barr Property, approximately 2.6 miles south of Pinon Bridge and immediately west of Overton Road. Erosion at this location is threatening an overhead power line with one pole within a few feet of the

cut bank. Currently, in design, the primary project goals are bank stabilization and erosion reduction.

- Pinon Bridge

The Project is located on Fountain Creek immediately upstream of Piñon Bridge, extending at least 1,200 feet upstream of the bridge. Since its construction, the new Piñon Bridge experiences increased risk due to flood flows in Fountain Creek that has caused lateral migration and widening of the creek upstream of the bridge. Work at Piñon Bridge will focus on realigning the creek to modify and enhance sediment transport capacity through the bridge and to promote long-term channel stability. Project components will include constructing a stable meander planform, bank stabilization, and revegetation.

- Pueblo Channel at 13th

This reach was identified as requiring localized bank reshaping and extensive riparian revegetation. Work will include channel meander planform and cross-section modifications including bank hardening and the potential for in-channel grade control. The anticipated restoration efforts will provide channel stability, reduced erosion, and corresponding sedimentation, restoration, and protection of adjacent wetlands, and the restoration and enhancement of riparian habitat. Project goals also include the protection of recreational assets and transportation infrastructure and the mitigation of future impacts from storm-induced runoff.

The City of Colorado Springs Stormwater Enterprise is also responsible for the completion of numerous stormwater-related projects in the watershed. Current information regarding these projects can be found at the following links:

<https://coloradosprings.gov/water-resources-engineering-stormwater/page/stormwater-project-map?mlid=33511>

<https://coloradosprings.gov/water-resources-engineering-stormwater/page/intergovernmental-agreement?mlid=28726>

17. Water Quality Characterization

17.1. Standards and Classification

Regulation #32, Classifications and Numeric Standards for the Arkansas River Basin was last updated on January 14, 2019; having the regulation in effect on June 30, 2019.

17.2. Surface Water

17.2.1. Issues and Concerns

The development of nutrient standards could lead to listing of stream segments in the watershed as water-quality impaired for total phosphorous and/or total nitrogen.

17.2.2. Approved TMDLs

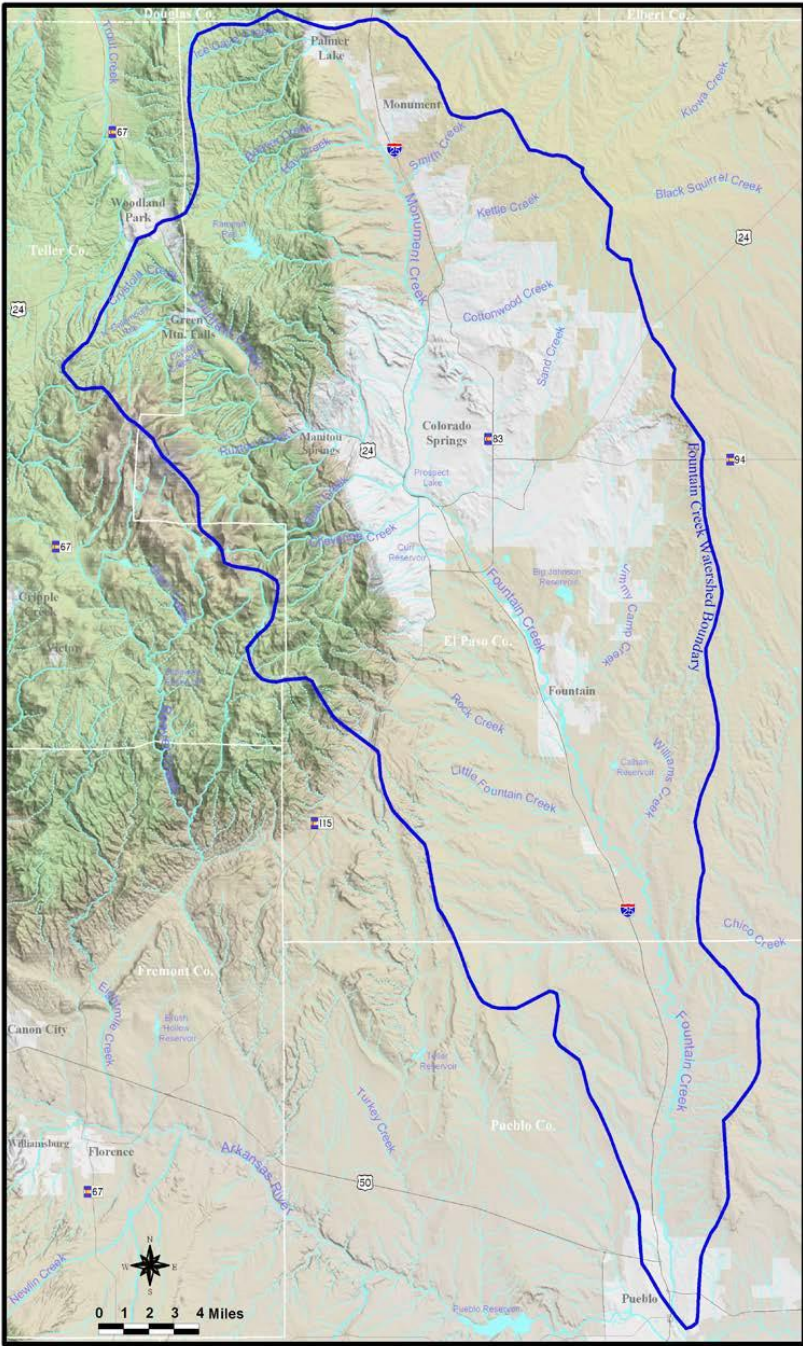
There are no approved TMDLs for the Fountain Creek Watershed.

17.2.3. Water Quality Impaired Stream Segments

On Colorado's Section 303(d) List of Impaired Waters and Monitoring and Evaluation List (amended 01/08/18, effective 03/02/18), *E. coli* is listed as a high priority for Monument Creek and the Upper and mainstem of Fountain Creek. Arsenic and manganese are listed as a low priority on the mainstem of Fountain Creek to above Monument Creek. More information regarding the 303(d) list can be found in Colorado's Section 303(d) List of Impaired Waters and Monitoring and Evaluation List, Regulation #93, available at:

<https://www.sos.state.co.us/CCR/GenerateRulePdf.do?ruleVersionId=7473&fileName=5%20CCR%201002-93>

17.3. Figure Fountain Creek Watershed Stream Locations



17.4. Fountain Creek Watershed 2018 Section 303(d) Water Quality Impairment List & Monitoring and Evaluation List

Segment	Segment Description	Affected Portion	Monitoring & Evaluation List	Water Quality Impairment	Priority
COARFO01a	Fountain Creek and tributaries above Monument Creek	All	Uranium (Total) Cadmium (Total) Lead (Total)	<i>E. coli</i> Arsenic (Total) Manganese (Dissolved)	H/L/L
COARFO02a	Fountain Creek, Monument Creek to Hwy 47	All	Iron (Total) Iron (Dissolved) Temperature Lead (Total)	<i>E. coli</i>	H
COARFO02b	Fountain Creek from Hwy 47 to the Arkansas River	All		<i>E. coli</i> Iron (Dissolved) Iron (Total) Temperature	H/L/M/M
COARFO03	Tributaries to Fountain Creek on USFS or AFA lands, Monument Creek to Arkansas River	West Monument Creek tributaries		Macroinvertebrates (Provisional)	L
COARFO04	All tribs to Fountain Creek, which are not on National Forest or Air Force Academy Land	Se is listed on Sand Creek tributaries. <i>E. coli</i> for the entire section.	Selenium (Dissolved) Sulfate	<i>E. coli</i> Selenium (Dissolved)	H/H
COARFO06	Monument Creek from National Forest to Fountain Creek	Seasonal (May – October) <i>E. coli</i> applies to mainstem of Monument Creek, from the boundary of National Forest lands to the confluence with Jackson Creek.		<i>E. coli</i> Macroinvertebrates (Provisional) Manganese (Dissolved) Temperature	H/L/L/M

COARFO07a	Pikeview Reservoir, Willow Springs Ponds #1 and #2	Willow Springs Ponds #1 & #2		Aquatic Life Use (PCE FCA)	M
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17.4.1. Water Quality Trend Analysis

The water quality trend analysis is broken up into individual pollutants and is also discussed in the Fountain Creek Watershed Strategic Action Plan.

17.4.2. Bacteria

Bacteria are very small, single-celled life forms that exist everywhere. There are many different types of bacteria, and some types can cause illness in people. Two types of bacteria, fecal coliforms and *E. coli* (a specific type of fecal coliform bacteria), are used to monitor the possible presence of disease-causing organisms in surface waters. These bacteria, called indicator bacteria, are present in high numbers in the intestines of humans. Wildlife (deer, elk, ducks, geese), livestock (cattle, horses), and domestic animals (dogs, cats) also carry *E. coli* and fecal coliform bacteria. This is true for both healthy people and animals and for those who are ill. Pathogenic microorganisms that can cause human disease may be present where levels of indicator bacteria are high. As a result, it might be unsafe to swim or wade in Fountain Creek when levels of indicator bacteria are high, although it is difficult to determine if high levels of bacteria directly cause an individual to become sick.

The standards for Recreation Class E - Existing Primary Contact Use waters are 126 *E. coli* bacteria per 100 milliliters of water. The U.S. Environmental Protection Agency estimates at these levels, for each 1,000 people exposed, eight may become ill. Monitoring conducted by the Pueblo City/County Health Department show bacteria frequently exceed water quality standards in Fountain Creek, especially in the summer and after storms. Indicator bacteria also occur in sediments in Fountain Creek, but because there are no water quality standards for bacteria in sediments, it is difficult to say whether the bacterial numbers in Fountain Creek sediments are unusually high. The amount of bacteria that exists in sediment is difficult to determine because it is impossible to capture all the bacteria in the sediment, and it is difficult to get accurate and consistent measurements. More work needs to be conducted in order to determine the amount of *E. coli* in the bed material to determine potential health effects.

Bacteria levels in water appear to be directly related to flows and water temperature. When

flows are high, such as after a summer storm, higher bacteria levels are found in Fountain Creek during and for a few days after the storm. Sources of bacteria could include storm runoff from urban areas, raw sewage spills, failing onsite wastewater systems, wildlife (deer, elk, geese), livestock (cattle, horses, pigs, poultry), and runoff from farms, ranches, and open areas. Two separate studies were conducted on different stretches of Fountain Creek through the use of microbial source tracking methods (using DNA from *E. coli* bacteria) to determine whether *E. coli* sources are from people or animals. By identifying the main sources of bacteria, it may be possible to reduce bacteria levels in Fountain Creek so standards are attained. A cooperative study between the USGS, Colorado Springs Utilities, the City of Colorado Springs, and the Colorado Department of Public Health and Environment was completed in 2009 on Upper Fountain Creek from Green Mountain Falls to the confluence of Fountain Creek and Monument Creek to identify sources of *E. coli*. Birds were identified as a probable source of fecal contamination, which was validated and supported through water quality testing of nitrogen, phosphorous, and contaminants commonly found in wastewater. It was found that human contamination was not the major cause of fecal contamination which was also supported through other lines of evidence, in particular the lack of wastewater-associated chemicals. An overview of this study is available at: <https://www.fountain-crk.org/wp-content/uploads/2019/04/e-coli-study-overview.pdf>

17.4.3. Selenium

Selenium is a natural element. There is an unusually large amount of selenium in the Pueblo County portion of the Fountain Creek watershed, substantially more than is found in most areas. High concentrations of selenium are found in the bedrock and soils underlying Fountain Creek and its tributaries. Selenium is picked up by surface water and groundwater as it flows over or through the soils and bedrock, resulting in increased amounts of selenium in the water. Because of these factors, Fountain Creek between the Pinón Road crossing and the Arkansas River consistently exceeds the water quality standard.

When animals eat, they take in materials like selenium from the environment. Unlike other substances, the selenium not used as a nutrient does not pass out of the body. Instead, excess selenium is stored in body tissues. This is called “bioaccumulation.” High levels of selenium in body tissue can cause birth defects in fish and birds. Water quality standards in Fountain Creek were established to protect fish and other wildlife, and the high levels of selenium in lower Fountain Creek are potentially harmful to fish, insects, and birds that nest and feed along the creek. Fish studied in 2005 and 2006 at several locations in Fountain Creek, in the Arkansas

River, and in other tributaries in the Arkansas Basin showed no evidence of birth defects due to selenium. This study found numbers and types of fish and aquatic insects were lower at a site in the Wildhorse Creek basin where the selenium concentrations were highest. No effects on fish health or on fish or insect populations caused by selenium were found to occur in the locations studied on Fountain Creek.

In 2007, the selenium chronic standard was changed to the naturally occurring selenium concentration in the creek, based on the results of studies that demonstrate natural, geological sources are the principal sources of selenium in portions of Segment 2b of Fountain Creek (Highway 47 Bridge to Confluence of Fountain Creek and Arkansas River).

17.4.4. Total Dissolved Solids

Total dissolved solids (TDS) and salinity are measures of the amount of salts dissolved in water. Electrical conductivity is an indirect measure of the amount of salts in water. The Sodium Absorption Ratio (SAR) is a specific measure of how salt might harm plant growth. High TDS impairs crop growth and can cause salts to build up in soil so the soil will no longer support crops. High TDS creates “hard” drinking water and can create an undesirable taste in drinking water. There is no numeric water quality standard in Colorado for TDS for either irrigation or for drinking water. However, the WQCD has developed policy WQP-24 Implementing Narrative Standards in Discharge Permits for the Protection of Irrigated Crops (March 2008) regarding SAR and TDS effluent limits in discharge permits:

<https://www.colorado.gov/pacific/sites/default/files/WQP24.pdf>

The Water Quality Control Commission recognizes excessive salinity and TDS levels can be detrimental to the water use classifications. The Commission established salinity standards for the Colorado River Basin but not for other waters, and the Commission has not developed control practices for salinity or TDS. The State of Kansas has expressed concern regarding TDS levels in the Arkansas River.

17.4.5. Nutrients

The term “nutrients” includes different forms of phosphorus and nitrogen that can act as fertilizers to stimulate the growth of algae and other aquatic plants in water bodies. Algae growth can cause several types of problems, especially in lakes, including unsightliness, unpleasant taste in drinking water, and fish kills. Fish kills can be caused by the decay of dead algae that consumes oxygen needed by fish to live. Nutrient impacts may not be seen where the nutrients enter the river but may occur at downstream locations such as lakes and

reservoirs where nutrients build up in non-flowing waters. U.S. Environmental Protection Agency is pressing states to adopt nutrient standards at the earliest possible time, and Colorado has begun the process. In 2012, the Colorado WQCC adopted a new section 31.17 in the Basic Standards and Methodologies for Surface Water, Regulation #31, to address nutrients, and a new Regulation #85, Nutrients Management Control Regulations. Limiting the amount of nutrients entering rivers will require significant changes in many activities including fertilizing lawns and agricultural fields, irrigating lawns and agricultural fields, and managing livestock wastes, as well as controlling runoff from cities and adding new processes for treating wastewater.

Phosphorous is not directly harmful to humans and animals, but it can stimulate toxic algae blooms or oxygen depletion. Nitrate can be harmful at high levels to humans and animals. The drinking water limit for nitrate, a form of nitrogen, is 10 milligrams per liter. Planting or maintaining vegetation along the riverbanks and controlling urban runoff can help to reduce the level of nutrients in the river. Additionally, there are agricultural management methods such as matching fertilizer to crop needs, keeping runoff from manure out of the river, and reducing erosion that reduces nutrient levels. Ammonia, another form of nitrogen, is also a nutrient and can be harmful to fish. Colorado adopted new ammonia standards in 2007 based on the EPA standards. The new ammonia standards for warm-water streams are significantly lower (more restrictive) than the old standards.

17.4.6. Sediment

Flow conditions combined with other factors (e.g., geology, stream modification, etc.) result in increased erosion and sediment transport. As the creek is trying to re-establish equilibrium and adjust for these additional flows, it alters its meander pattern and promotes increased bank erosion and down-cutting of the creek bed, which are all evident processes currently taking place within Fountain Creek and its tributaries.

17.4.7. Organics

There are numeric standards for 19 organic parameters that were adopted as basic standards applicable to all waters of the region. These standards are designed to protect the waters of the state regardless of the use classifications because they describe the fundamental conditions that all waters must meet to be suitable for any use. These standards are captured in the Basic Standards and Methodologies for Surface Water, Regulation #31.

17.4.8. Mercury

Mercury is becoming an increasing pollutant of concern. A substantial amount of research has tied air pollution fallout from coal-fired power plants to mercury in the runoff.

17.5. Monitoring Network

Within the Fountain Creek Watershed, there are 14 active USGS monitoring stations located primarily on Fountain and Monument creeks and major tributaries. These stations measure different types of water quality parameters, such as flow, biological nutrients, organics, inorganics, physical properties, radioactive chemicals, and sediment. A link to the USGS monitoring stations and water quality, streamflow and groundwater data can be found at <http://co.water.usgs.gov/>

17.6. Groundwater

17.6.1. Denver Basin Bedrock Aquifers

The Denver Basin Bedrock Aquifers consist of four bedrock aquifers (USGS, 1988) which in descending order from the surface are: Dawson aquifer, Denver aquifer, Arapahoe aquifer, and Laramie-Fox Hills aquifer. Most of the water contained in the upper aquifers and near the basin boundaries is considered to be tributary to surface water sources. The Denver groundwater basin underlies a 6,700-square-mile area (including part of Fountain Creek and Black Squirrel Creek Watershed) that includes the northern half of El Paso County.

The communities in Northern El Paso County such as Monument, Palmer Lake, Peyton, and Black Forest have wells in either the Dawson or Denver aquifers. Palmer Lake draws most of its water from Monument Creek but also has two wells in the Denver Basin aquifers. Monument has nine wells that supply drinking water and six of the nine are in one of the alluvial or Denver/Dawson aquifers. These communities primarily utilize the wells in the shallowest portions of the aquifer (alluvial aquifer) for drinking water sources. Triview, Forest Lakes, Donala, Pleasant View, and Sun Hills also get all or part of their drinking water from the Denver Basin aquifers. To protect public groundwater supplies from contamination, well-head protection programs were developed by the Town of Monument with assistance from the Colorado Water Quality Control Division.

The Upper Monument Creek subbasin water purveyors are actively seeking renewable water sources. The Donala Water and Sanitation District presently obtains almost half of its annual supply from its own surface water sources delivered to the District through the

Colorado Springs Utilities transmission and distribution system.

17.6.2. Widefield Alluvial Aquifer

The shallow, unconfined alluvial aquifer is located adjacent to Fountain Creek in southwestern El Paso County between Colorado Springs and Widefield. Water quality in the aquifer can be variable due to variability in the sources of aquifer recharge. The two primary ongoing water quality problems associated with the Widefield alluvial aquifer are Schlage Lock industrial waste related contamination and the presence of perfluorinated compounds, also referred to as per- and polyfluoroalkyl substances (PFASs), found in the alluvial aquifers in the Fountain Creek valley during monitoring in 2013. The WQCC assigned site specific water quality standards for two PFASs, PFOS and PFOA, in the Fountain Creek alluvial aquifer in 2018. Schlage Lock continues to operate remediation systems addressing perchloroethylene (PCE) and the United States Air Force is addressing the mitigation of PFOS and PFOA with water quality mitigation systems for affected water utilities.

17.6.3. Fountain Creek Alluvial Aquifer

The Widefield Aquifer and Fountain Creek Alluvial Aquifers are considered separate. The aquifers are the primary municipal water supply for El Paso County and the communities of Stratmoor Hills, Fountain, and Security/Widefield. Classifications of the confined and unconfined groundwater in the specified area are domestic and agriculture use quality. Concentrations of dissolved nitrate-nitrogen have exceeded the federal drinking water maximum concentration of 10 mg/l in several areas of the aquifer. There were limited studies since the 2003 update of the 208 Plan assessing the groundwater quality of this alluvial aquifer. In 2018, Regulation 42 (SITE-SPECIFIC WATER QUALITY CLASSIFICATIONS AND STANDARDS FOR GROUND WATER) was updated to reflect a site-specific standard for the sum of Perfluorooctanoic Acid (PFOA) and Perfluorooctane Sulfonate (PFOS) in Specific Area 7. Specified Area 7 is located in central El Paso County in the vicinity of Fountain Creek.

Monument Creek flows into Fountain Creek, which flows into the Arkansas River. About 85% of the drinking water (supplied by Colorado Springs Utilities) is from transbasin diversions. The creeks and alluvial aquifer wells tributary to Monument Creek and Fountain Creek do provide a small source of drinking water for Colorado Springs and are a source of irrigation for more than 100 farmers and ranchers. Fountain Creek alluvial wells provide more than half of the water supply to Security, Widefield, Fountain, and Stratmoor Hills.

17.7. Land Use

The Fountain Creek Watershed reflects a variety of possible land uses: residential (high, medium, and low density), commercial and office, industrial, parks and open space, schools and institutions, agricultural, and undeveloped land. Most of the agricultural land is located along the lower portion of Fountain Creek. The amount of residential and commercial development is increasing in the watershed. Residential and commercial development in unincorporated El Paso County has undergone large increases between 2002 and the present.

17.8. Population and Socioeconomic Characteristics

Anticipated growth in the region reinforces the importance of not only understanding the correlation between population growth and watershed health but also formulating a plan to minimize the adverse effects of future growth. Many critical issues—from transbasin diversion rates to impervious cover and resulting stormwater runoff rates—are reflections of regional population dynamics. Population projections serve as the basis for determining the amount of water necessary to meet the forecasted demand for 20 to 40 years.

17.9. Characterization of Watershed Issues

The primary issues to address in the Fountain Creek Watershed are water quality, erosion, sedimentation, and flooding. However, the importance of each of these issues is different throughout the watershed and is based upon the different physical processes operating in the watershed, the management practices in use, and the technical strategies being applied.

It is evident that as the Fountain Creek Watershed becomes increasingly urbanized, problems and issues associated with the main streams draining the basin have become more common. Erosion, sedimentation, and flooding problems have highlighted the need to understand the consequences of development activities in the watershed.

These activities alter the basic parameters most affecting channel changes and controlling erosion and sedimentation problems in the Fountain Creek Watershed, all of which are interrelated, include:

- Increased baseflow discharge
- Increased sediment supply and transport
- Floodplain encroachment by development
- Channel realignment

- Channel bank protection and grade control

17.10. Overview of Watershed Activities

Several ongoing efforts at technical and policy levels are trying to address the problems and issues within the Fountain Creek Watershed. An activity matrix was developed (available at www.fountain-crk.org) that lists the goals, activities, and status of all ongoing projects dealing with drainage, flood mitigation, planning, regulatory policies, transmountain diversions, public education, and modeling (GIS and remote sensing).

Some of the primary activities since the last update of the 208 Plan are:

- Completion of a Fountain Creek Watershed Strategic Action Plan, which assesses the current conditions and strategies for water quality and sedimentation, land use planning and development, flooding and stormwater management, municipal water supplies and return flows, recreation, wetlands, wildlife, agriculture, outreach, and funding/coordination. This report consists of a series of individual reports and was completed in December 2008. For each recommendation, a lead agency and a time frame is given.
- Development of an Army Corps of Engineers Watershed Study. The study started in 2003 and a final report was completed in December 2008. The four principal products of this study are:
 - Environmental baseline report, which contains detailed information on hydrology, hydraulics, geomorphology, soils, threatened and endangered species, fish, wetlands, wildlife migratory corridors, and other information;
 - GIS database of all the electronic data and information collected;
 - Specific technical strategies that focused on ecosystem restoration projects, flood risk reduction projects, and channel stability projects (a total of 46 potential projects were evaluated);
 - General recommendations that primarily address policies that would directly or indirectly effect erosion, sedimentation, and flooding (seventeen general recommendations were made).

The formulation and analysis of alternative solutions to the problems identified in the

ACOE Watershed Study will be conducted through separate projects that will require a sponsor, a feasibility cost-sharing agreement, and an intergovernmental agreement.

- Fountain Creek Corridor Master Plan, which focuses on the mainstem of Fountain Creek.

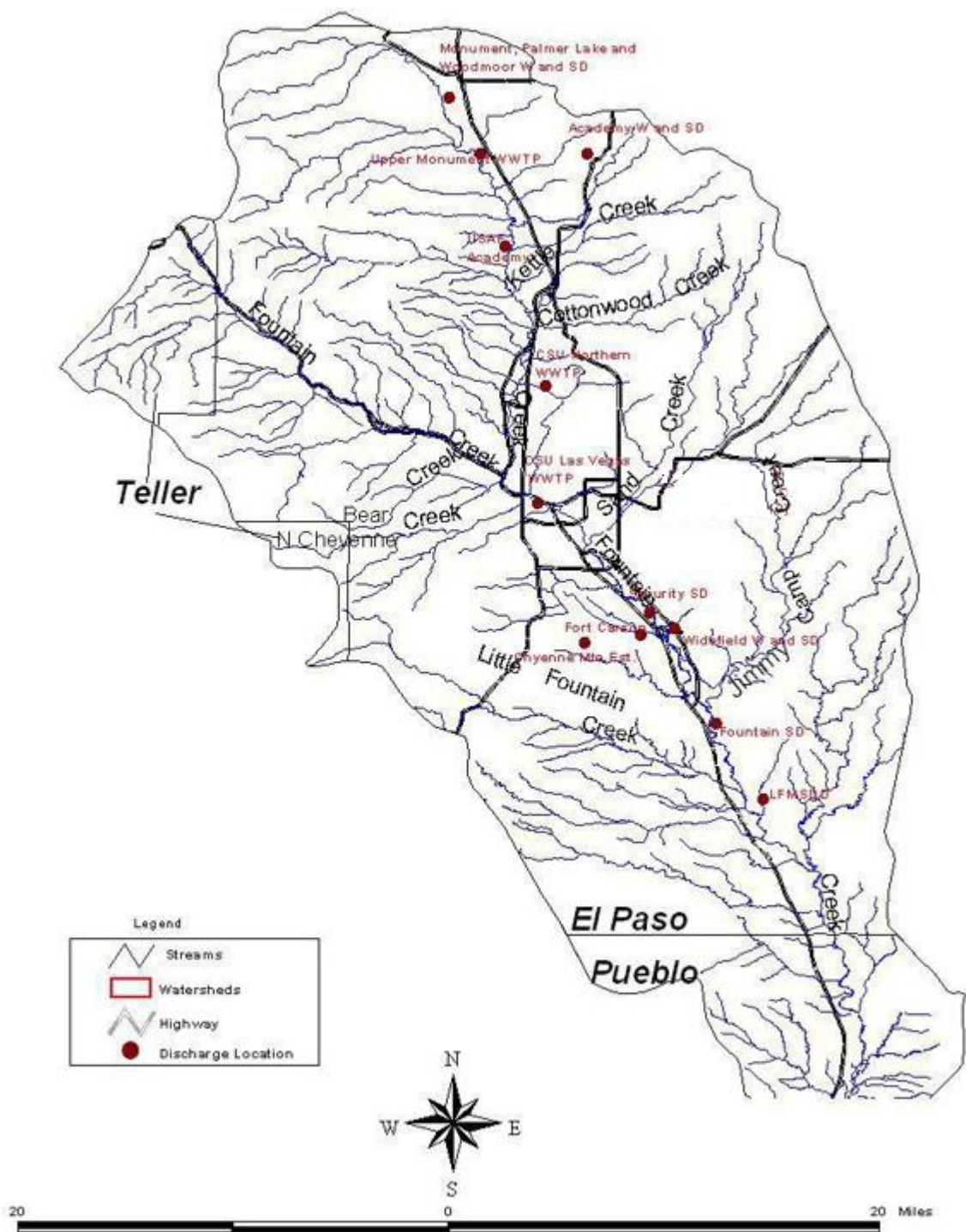
Fountain Creek Watershed Greenway and Flood Control District was created in 2009 by the Colorado State Legislature. The district is discussed further in Section 8.5 (Water Quality Management Associations and Watershed Planning Groups).

17.11. Point Source Dischargers

17.11.1. Overview

Fountain Creek Watershed currently has 12 major (discharge > 0.05 mgd) wastewater treatment plant dischargers, shown on Table 7, Appendix C, which primarily discharge either to Fountain Creek, Monument Creek or tributaries to these creeks. Colorado Springs Utilities operates the largest discharge facilities in the watershed. Table 17.13 shows the minor (< 0.05 mgd) discharge facilities (both surface water and groundwater).

17.12. Fountain Creek Watershed Point Source Discharge Locations



17.13. Fountain Creek Watershed Discharge Locations Minor Facilities < 0.05 mgd)

Wastewater Treatment Plant	Permit No.	Discharge Location	Mgmt. Area	Design Capacity (mgd)
Edith Wolford Elementary School	CO-0046825 (exp 10/31/09)	Unnamed tributary of Kettle Creek	UM	.0078
Benet Hill Monastery	Approval letter issued 1/31/08	Discharge to groundwater via absorption field	UM	.0042
Peyton School District	COX-0047201 (exp 2/28/11)	Discharge to groundwater via soil absorption fields	LF	.0087
The Occasion Event Center (Septic System)	Approval letter issued 12/15/06	Discharge to groundwater via absorption fields	UM	.0046

17.14. Future Needs Assessment

This section discusses the future wastewater needs in the Fountain Creek Watershed over the next 20 years and is broken up by districts.

17.14.1. Colorado Springs Utilities

The permit for both Las Vegas Street Water Resource Recovery Facility (LVSWRRF) in Colorado Springs and the J.D Phillips Water Resource Recovery Facility (JDPWRRF) was updated to include *E.coli*, which allows future needs to meet nutrient requirements. Colorado Springs Utilities is also a part of the state's Voluntary Incentive Program, which allows facilities to make nutrient reductions in exchange for an extended compliance schedule. The program also creates certainty regarding the year the facility will need to meet water quality based effluent limits.

17.14.2. United States Air Force Academy (USAFA)

Colorado Springs Utilities is collaborating with the USAFA to own and operate their wastewater treatment and collection systems. If an agreement is reached between USAFA and CSU, the existing USAFA wastewater collection and treatment systems would be integrated into the existing CSU systems. Future options for wastewater management include a wastewater pipeline or interceptor from the USAFA to the JDPWRRF, plus the decommissioning of the USAFA wastewater treatment plant and a return non-potable pipeline

to provide irrigation water for the USAFA. Additional options include new gravity pipelines and the potential to decommission one or more lift stations.

17.14.3. Academy Water and Sanitation District

The Academy Water and Sanitation District (AWSD) received a renewed discharge permit in 2013 with a compliance schedule to attain specified effluent ammonia limits by the third quarter of 2018. The AWSD evaluated its needs and determined it was in its best interest to connect to the Donala Water and Sanitation District (DWSD) and receive wastewater treatment services through the Upper Monument Creek Regional Wastewater Treatment Facility. A service agreement was developed with the DWSD which provides for a maximum 30-day reserved capacity of 70,000 gallons per day, sufficient for the buildout of the AWSD service area. The AWSD completed the connection to the DWSD system in 2018, ceasing discharge from its existing WWTF. The AWSD will continue to operate its wastewater collection system in the existing District service area.

Options the USAFA is evaluating include:

- Modifications to the existing aerated lagoon treatment system so the treatment plant would be compliant with ammonia standards.
- Connection to Upper Monument WWTP—The existing lagoon system of Academy W & SD would be replaced with a lift station and all wastewater would be treated at the Upper Monument WWTP. Abandonment of the lagoon system would take place after the lift station is completed.
- Connection to Colorado Springs Utilities.

17.14.4. Fort Carson

Fort Carson is experiencing significant growth in facilities and personnel as a result of Base Realignment and Closure (BRAC) and Grow the Army (GTA) initiatives. As a result there's a need to upgrade and expand the utility infrastructure in the cantonment area and Butts Army Air Field area. Design work is already underway to incrementally increase the rated capacity of the wastewater treatment facility. When this project is completed, the capacity of the plant will be sufficient to handle the projected growth. Impacts related to future requirements of the CWA and Colorado Water Quality Control Commission regulations cannot be predicted at this time.

17.14.5. Widefield Water and Sanitation District

The overall plant capacity will handle expected five-year growth. Possible upgrades and replacements to enhance current operations include:

1. Replacement of disinfection equipment;
2. Upgrades of aerobic digestion facility;
3. Addition of operations center; and
4. Potential sludge de-watering facility.

It is estimated the District will need to begin planning for plant expansion. The plant is plumbed for 5.0 mgd and already has several processes that are built to accommodate expansion to 5.0 mgd. This is expected to include: additional equipment in headworks (already has 5.0 mgd hydraulic capacity); additional primary clarifiers; expansion of aeration basins or process conversion; addition of de-nitrification recycle if required (anoxic zones are already constructed), one additional final clarifier, conversion of disinfection to UV and addition of plant water system, double aerobic digestion/sludge handling capacity, and other upgrades in minor processes. Equalization facilities will also be necessary in the next five to ten years.

Within the next five years a re-rating of the organic capacity (this would not require physical construction) might be needed. There is a substantial discrepancy between the rated organic capacity and actual organic capacity. The actual organic load capacity is actually understated and noted so in the discharge permit.

At this time, the 20-year plan does not anticipate major expansions beyond 5.0 MGD plant capacity. However, line extensions and plant upgrades are expected in order to keep pace with changing discharge requirements. No accurate capital cost estimates other than annual allocations for beyond the 10-year outlook were made.

17.14.6. Upper Monument Creek Regional (UMCR) WWTF

The UMCR WWTF is permitted for a maximum throughput capacity of 1.75 mgd. It has operated at approximately 0.69 mgd during 2018, about 39 percent of permitted throughput capacity. Development in the service areas of the three facility owners is projected to require about 2.2 to 2.5 mgd at projected buildout. The existing capacity in the UMCR WWTF is projected to be sufficient for no less than 10 years. The UMCR WWTF is planning for

phosphorus control improvements for implementation in about 2028-2033. Alternatively, there may be the opportunity for regionalization with Colorado Springs Utilities subject to resolution of water resource management conditions between the Colorado Springs Utilities and the wastewater and water utilities in the Upper Monument Creek basin.

17.14.7. Fountain Sanitation District

Estimated five-year construction needs include:

- Continued implementation of the Wastewater Collection System Master Plan;
- Continued update of sewer use regulations, and design and construction regulation;
- Evaluate wastewater treatment facility capability improvements to address future effluent limits for nutrients and metals. Construction of possible treatment improvements will be in the 2027-2032 timeframe;
- Finalize and implement biosolids management plan in coordination with the Lower Fountain Metropolitan Sewage Disposal District; and
- Continue implementation of District's financial management plan.

17.14.8. Security Sanitation District

The Security Sanitation District is continuing its implementation of improvements at the facility to provide for consistent compliance with ammonia and TIN effluent limits. It has assessed the wastewater management needs for service area buildout and determined the throughput capacity of the treatment facility can be changed to 1.95 mgd from 2.4 mgd. Accordingly, the District elected to delay implementation of phosphorus control until at least 2027 when more refined site-specific effluent limits for nutrients may be known. The District is implementing advanced activated sludge treatment and providing for mechanical thickening and dewatering of biosolids in a capital improvement project to be completed in 2020.

17.14.9. Lower Fountain Metropolitan Sewage Disposal District

Estimated five-year construction needs include:

- Continue regional planning with Colorado Springs Utilities.
- Provide for support of the regional water quality evaluation for

determination of site-specific nutrient water quality requirements.

- Plan for compliance with site specific nutrient standards in the 2027-2032 timeframe.
- Provide service to existing and new members of the District.

17.15. Industrial

Colorado Springs Utilities maintains an approved industrial pretreatment program, which administers technically based local limits (incorporated into Colorado Springs City ordinances). The continued implementation of this program provides additional assurance that the water quality standards of Fountain Creek Segment 2 are protected. Local limits for several pollutants were developed (arsenic, cadmium, chromium, copper, lead, fluoride, mercury, nickel, zinc, selenium, and silver) in addition to narrative prohibitions against numerous additional wastes and wastewaters. The pretreatment program also oversees septic waste haulers and miscellaneous point source discharges to the wastewater collection system. The 2018 average industrial flows into Colorado Springs Utilities total 6,290,000 gpd with 110,000 gpd being discharged to the JDPWRRF and 6,180,000 discharging to the LVSWRRF. The largest dischargers and their approximate average process flow (gpd) are: MicroChip (formerly Atmel) (two buildings, 1280 and 1350): 846,794 gpd; Reliable Sanitation: 396,290; Martin Drake Power Plant: 383,212 all of which discharge to LVSWRRF;

Industrial dischargers are also currently made to the Security Sanitation District and Tri- Lakes WWTF Systems. The Security Sanitation District has an approved pretreatment program and receives nonresidential wastewater from Schlage Lock Company. Schlage Lock Company is a categorical industry discharging treated electroplating wastewater to the district. Schlage Lock Company is consistently in compliance with the local limits and its industrial waste discharge permit.

The Tri-Lakes WWTF receives treated industrial wastewater from Synthes Corporation, a metal finisher and electroplater that manufactures medical implant devices. The Tri-Lakes WWTF has a pretreatment program implemented through the sewer regulations of its joint use districts.

17.16. Utilities and Districts—Current Operations

Fountain Creek Watershed has the most dischargers and site application requests for expansion, lift stations, and modifications to existing facilities of any of the five watersheds in the Pikes Peak region.

17.16.1. Colorado Springs Utilities

Colorado Springs Utilities owns and operates two WRRFs—Las Vegas Street Water Resource Recovery (LVSWRRF) and J.D. Phillips Water Resource Recovery Facility (JDPWRRF), which are described in more detail below.

17.16.2. Las Vegas Street Water Resource Recovery Facility

The Colorado Springs Utilities LVSWRRF is rated at a capacity of 75 mgd. Treatment consists of preliminary screening and grit removal, primary clarification, and secondary treatment. The treatment plant has two secondary treatment processes: an advanced wastewater treatment (AWT) process and a trickling filter/solids contact (TF/SC) process. The AWT plant is a single sludge nitrification/de-nitrification activated sludge biological process where ammonia nitrogen is oxidized. The TF/SC is a biological process where carbonaceous BOD and TSS are reduced. The UV disinfection occurs prior to the discharge to Fountain Creek. A 12-mgd tertiary treatment process is also located at the Las Vegas Street Water Resource Recovery (LVSWRRF). This process filters and then chlorinates plant effluent for non-potable irrigation and other reclaimed wastewater uses.

All of the liquid stream treatment currently takes place at the LVSWRRF and the solids treatment process is located at the Clear Spring Ranch Solids Handling and Disposal Facility (CSRSHDF). Sludge is conveyed to the CSRSHDF via an 18-mile single 14" pipeline. Treatment at the facility consists of eight anaerobic digesters, nine facultative sludge basins, two supernatant lagoons, and a dedicated land disposal area of 264 acres.

Wastewater treatment services for areas outside of city limits are provided under contract to the City of Manitou Springs, Peterson Air Force Base, Garden Valley, and Stratmoor Hills.

Ongoing planning activities include: a collection system expansion which will serve newly annexed and in-fill areas; a treatment facility upgrade which will accommodate new permit limits; planning for eventual service to the Jimmy Camp Creek basin and the remainder of the Sand Creek drainage basin; analysis of data and revision of the United States Geological Survey (USGS) stream monitoring program; water resource studies; transmountain water; and long-range planning for the future. CSU has a pretreatment program for industrial discharges within its service area. The plant discharges to the mainstem of Fountain Creek (Segment 2a) via the Fountain Mutual Irrigation Canal, located about one mile downstream from the Nevada Avenue Bridge.

17.16.3. Colorado Springs Utilities J.D. Phillips Water Resource Recovery Facility

The CSU J.D. Phillips Water Reclamation Facility (JDPWRRF) consists of a headworks with mechanical bar screens, aerated grit removal, primary settling basins, activated sludge aeration basins, final settling basins, tertiary filtration with UV disinfection for reuse and UV disinfection for effluent not going through the reuse portion of the facility, and influent and effluent flow measuring using Parshall flumes with ultrasonic sensors.

Biosolids removed at the JDPWRF are discharged to the Monument Creek Interceptor, which leads to the headworks of the LVWRRF. Biosolids are then removed at the LVSWRRF and conveyed to the CSRSHDF as described above. The plant discharges to Monument Creek (Segment 6) south of Pikeview Reservoir.

17.16.4. Academy Water and Sanitation District

The Academy Water and Sanitation District ceased operation of its WWTF in 2018 and connected its wastewater collection system to the Donala Water and Sanitation District wastewater management system. The AWSO will continue to operate its collection system within its service area. There is little to no need for service area expansion as all surrounding areas are platted with large lot rural development currently using OWTS systems for residential wastewater management.

17.16.5. Upper Monument Creek Regional (UMCR) Wastewater Treatment Facility (Donala Water & Sanitation District, Forest Lakes and Triview Metropolitan Districts)

The Donala Water & Sanitation District operates the Upper Monument Creek Regional Wastewater Treatment Facility (UMCR WWTF) which receives wastewater generated in the service areas of each of the three Districts. This plant discharges to Monument Creek (Segment 6) at the southwest corner of the service area.

The developments associated with Forest Lakes and Triview Metropolitan Districts completed the construction of the Upper Monument Creek Regional Wastewater Treatment Facility in 1988. The facility was commissioned in 1995 and is used by Forest Lakes and Triview Metropolitan Districts and Donala Water and Sanitation District. The UMCR WWTF is operated by the Donala Water & Sanitation District in accordance with a service agreement between the three Districts. The facility consists of an activated sludge system with nitrification and de- nitrification in a sequencing batch reaction system. Waste solids stabilization is accomplished in aerobic digestion. In addition, an up-flow, continuous backwash effluent filtration system remains available for use. Biosolids are dewatered on site and hauled

to land application for beneficial use by a contract hauler. The design capacity is permitted at 1.75 mgd. Subsequent upgrades and expansions will be accomplished as loading dictates to reach an ultimate build-out capacity of approximately 2.2 to 2.5 mgd. Facility capability upgrades will be necessary to address site-specific nutrient effluent limits in approximately 2027-2032.

17.16.6. Tri-Lakes Joint Use Wastewater Treatment Facility (Monument, Palmer Lake, and Woodmoor Water and/or Sanitation Districts)

The Tri-Lakes Joint Use Wastewater Treatment Facility is jointly owned by the Palmer Lake Sanitation District, Monument Sanitation District, and Woodmoor Water and Sanitation District. The three districts negotiated and entered into a Joint Use of Facilities Agreement on June 6, 1996. This agreement addresses issues associated with the joint operation and ownership of the facility and its treatment capacity. Monument Sanitation District owns 19.79% of the 4.2 mgd capacity, with Palmer Lake Sanitation District owning 15.93%, and Woodmoor Water & Sanitation District owning 64.29%. The facility was renamed Tri-Lakes Wastewater Treatment Facility in 1987 to reflect its use by these three entities. The facility discharges to Monument Creek (Segment 6) at the southern edge of the Tri-Lakes service area.

On December 1, 1997, the CDPHE issued a site approval which re-rated the existing plant capacity from 1.5 to 2.8 mgd. In addition, the site approval allowed the facility to be expanded to 4.2 mgd. The expansion added a third parallel treatment plant identical to the two existing trains. The treatment facility is an advanced wastewater treatment plant consisting of an activated sludge process that includes the screening, degritting, activated sludge treatment for the removal of BOD, nitrogen, and suspended solids; clarification; and UV disinfection. The facility also aerobically digests sludge and provides sludge storage prior to ultimate land disposal. The flows presently average 1.38 mgd.

17.16.7. United States Air Force Academy (USAFA)

The USAFA wastewater treatment facility consists of an oxidation ditch, filtration system, and UV disinfection. The treatment facility is permitted for a maximum throughput capacity of 1.4 mgd based on a 30-day average. The facility is designed to treat 2.2 mgd. Based on all available planning, the treatment capacity is expected to suffice for all wastewater management needs for the foreseeable future. No future treatment expansions of the facility are proposed.

A pump station directs effluent from the treatment facility to a nonpotable reservoir system for irrigation use throughout the USAFA. The USAFA's treatment facility generally achieves near-

zero discharge to local tributaries and Monument Creek (Segment 6) because of wastewater reuse through the USAFA's effluent recycle system. Any discharge to Monument Creek with treated effluent could occur if the nonpotable reservoirs are full, during emergency conditions, or when facility pumps are inoperable. The Academy's EPA- issued NPDES permit imposes the same effluent limitations irrespective of whether the discharge is to the nonpotable reservoirs or Monument Creek. The permit also addresses treated wastewater irrigation management.

17.16.8. Cheyenne Mountain Estates–Broadmoor Park (Formerly Broadmoor Village Park Properties)

The wastewater treatment facility is active and consists of a 0.06 mgd extended aeration plant with a lined polishing pond and chlorination facility. The facility discharges to a dry gully above a drainage that ends on the Fort Carson property (Segment 4). The serviced population (about 350) is not expected to change.

17.16.9. United States Army Fort Carson

Fort Carson's existing wastewater treatment facility (Figure 8-10) consists of preliminary treatment (coarse screening, aerated grit and grease removal, fine screening, flow measurement, and aerated flow equalization), secondary treatment (activated sludge aeration and secondary clarification), and tertiary treatment (filtration and ultraviolet light disinfection). The facility discharges to Clover Ditch (Segment 4) about one mile upstream of its confluence with the mainstem of Fountain Creek.

The facility is rated for 4.0 mgd. Impacts related to future requirements of the Clean Water Act and CWQCC regulations cannot be predicted at this time. The Fort Carson wastewater treatment facility receives pretreated wastewater from the adjacent industrial wastewater treatment facility, as well as sanitary and pretreated industrial wastewater from the nearby USAF Cheyenne Mountain Air Station.

17.16.10. Security Sanitation District

The Security Sanitation District is involved in a major capital improvement program at the treatment facility expected to be substantially completed in 2020. The primary goal of the improvements is to consistently attain compliance with ammonia discharge limits and control copper, zinc and cyanide in the effluent discharged to Fountain Creek.

An advanced activated sludge system with suspended media, commonly referred to as an integrated fixed film activated sludge or IFAS system is being constructed and retrofitted in the

existing plant. Waste biosolids will be thickened and stabilized with the existing anaerobic sludge digesters. Stabilized biosolids will be dewatered on-site and disposed by land application for beneficial use by a contractor. The facility will continue to discharge to the mainstem of Fountain Creek (Segment 2a) at a discharge location 3,000 feet upstream from the Carson Boulevard Bridge on Fountain Creek.

17.16.11. Widefield Water and Sanitation District

The Widefield Wastewater Treatment Facility is an activated sludge facility rated at 2.50 mgd hydraulic capacity. The plant is master-planned and partially plumbed to accommodate expansion to 5.0 mgd (the headworks can be expanded to 5.0 mgd rating with only additional “equipping”). Headworks facilities and other plant elements, including some major yard piping, were constructed to accommodate a 5.0 mgd capacity. The site is capable of supporting additional future expansions of up to 10–12 mgd total capacity. The facility discharges to the mainstem of Fountain Creek (Segment 2a) via a discharge location about 0.25 miles downstream from the Highway 16 Bridge.

The two primary clarifier units are operated in parallel and have a total rated capacity 2.5 mgd each. Splitter box and yard piping are upsized for additional units for a total capacity of 5.0 mgd. The aeration basins consist of two parallel rectangular basins with a total capacity of 2.5 mgd each. An anoxic zone basin is in place that could be converted to de- nitrification with addition of recycle.

Full duplication of capacity exists in final clarification, two circular units each with 2.5 mgd capacity. The current disinfection is gas chlorination with gas dechlorination. The primary and secondary sludges are blended and thickened to between 5% and 8% for digestion.

Aerobic digestion occurs in three tanks with static tube mixer/aerators. Sludge storage can be accomplished in three steel tanks provided by the contracting agency providing sludge disposal.

17.16.12. Fountain Sanitation District (FSD)

The Fountain Sanitation District treats wastewater from the City of Fountain and surrounding areas which are within the District’s service area. Wastewater has also been accepted and treated from the Pikes Peak International Raceway through contractual arrangements. The facility discharges to the mainstem of Fountain Creek (Segment 2a) via a discharge location at the southern edge of the treatment facility.

The wastewater treatment facility uses the extended aeration activated sludge process, which includes screening, grit removal, secondary sedimentation, disinfection by ultraviolet radiation, post-aeration, aerobic sludge digestion, and sludge dewatering with on-site sludge storage for off-site disposal. The facility was designed for the maximum month average daily flow of 1.904 mgd. Influent sewers, channels, and process piping that carry full plant flow were designed with a hydraulic capacity of 5 mgd to facilitate future expansion. As of January 2019, the District's Richard J. Christian II Wastewater Treatment Facility does not have capability for nutrient control although it does accomplish required nitrification. The requirement for total nitrogen and phosphorus control may not apply until 2027 to 2032.

The FSD will continue to evaluate its wastewater treatment facility needs for build-out of its service area on its existing treatment plant site with processes forecasted to be required to meet future permit limits. The need for major treatment capability changes may occur in 2027 to 2032 under the present regulations regarding nutrient control. The FSD may elect to provide a portion or all of that capability through its membership in the LFMSDD. The FSD may also determine it is most beneficial to its constituents to accommodate all biosolids management needs at the LFMSDD prior to the need for major treatment process changes to address nutrient control.

As a result of the District's membership in the Lower Fountain Metropolitan Sewage Disposal District (LFMSDD) and since commencement of operation of the LFMSDD's wastewater management facilities in 2013, a major portion of the wastewater generated in the District is treated by the LFMSDD.

17.16.13. Lower Fountain Metropolitan Sewage Disposal District (LFMSDD)

The Lower Fountain Metropolitan Sewage Disposal District is a metropolitan sewage disposal district (CRS Section 32-4-501, et seq.) created in 1986 for purposes of providing wastewater collection, treatment and disposal within the Jimmy Camp Creek basin of El Paso County. As a metropolitan sewage disposal district, the District is created for the purpose of owning and operating a wastewater disposal system to receive, transport, treat and dispose of wastewater from the wastewater management systems of municipalities (CRS Section 32-4-506). The municipalities as defined by the statute include statutory cities and towns, home-rule cities and quasi-municipal entities such as sanitation districts, water and sanitation districts and metropolitan districts which provide wastewater management services to their constituents. Municipalities are provided services by the LFMSDD through inclusion as a member of the District. Services to each member are governed by a service agreement addressing the

respective responsibilities and authorities of the member and District and the terms and conditions under which the District provides services.

As of January 2019, members of the LFMSDD are the Colorado Centre Metropolitan District (CCMD), the Fountain Sanitation District (FSD) and the City of Colorado Springs. The CCMD consists of approximately 4,100 acres and the majority of this land—over 3,500 acres—was annexed to the City of Colorado Springs in 1989 and consequently are served by Colorado Springs Utilities. CCMD owns and operates a wastewater collection and transmission system serving development within the CCMD which is connected to the LFMSDD interceptor sewer. The FSD wastewater collection system is likewise connected to the LFMSDD interceptor sewer.

The portion of the City of Colorado Springs and Colorado Springs Utilities service area included in the LFMSDD is generally defined as the part of the Jimmy Camp Creek basin south of US Highway No. 24, east of the Colorado Springs Municipal Airport and Peterson Air Force Base and north of Fontaine Boulevard. The Colorado Springs inclusion in the LFMSDD is currently limited to those areas defined above which are within the corporate limits of the City. It is however, planned that as needs arise in the Jimmy Camp Creek basin and annexations to the City of Colorado Springs are completed, added area within the Jimmy Camp Creek basin will be provided service by the LFMSDD. As of January 2019, the Colorado Springs Utilities system is not connected to the LFMSDD as there is currently no demand for services in the tributary area of the Colorado Springs Utilities system included in the LFMSDD.

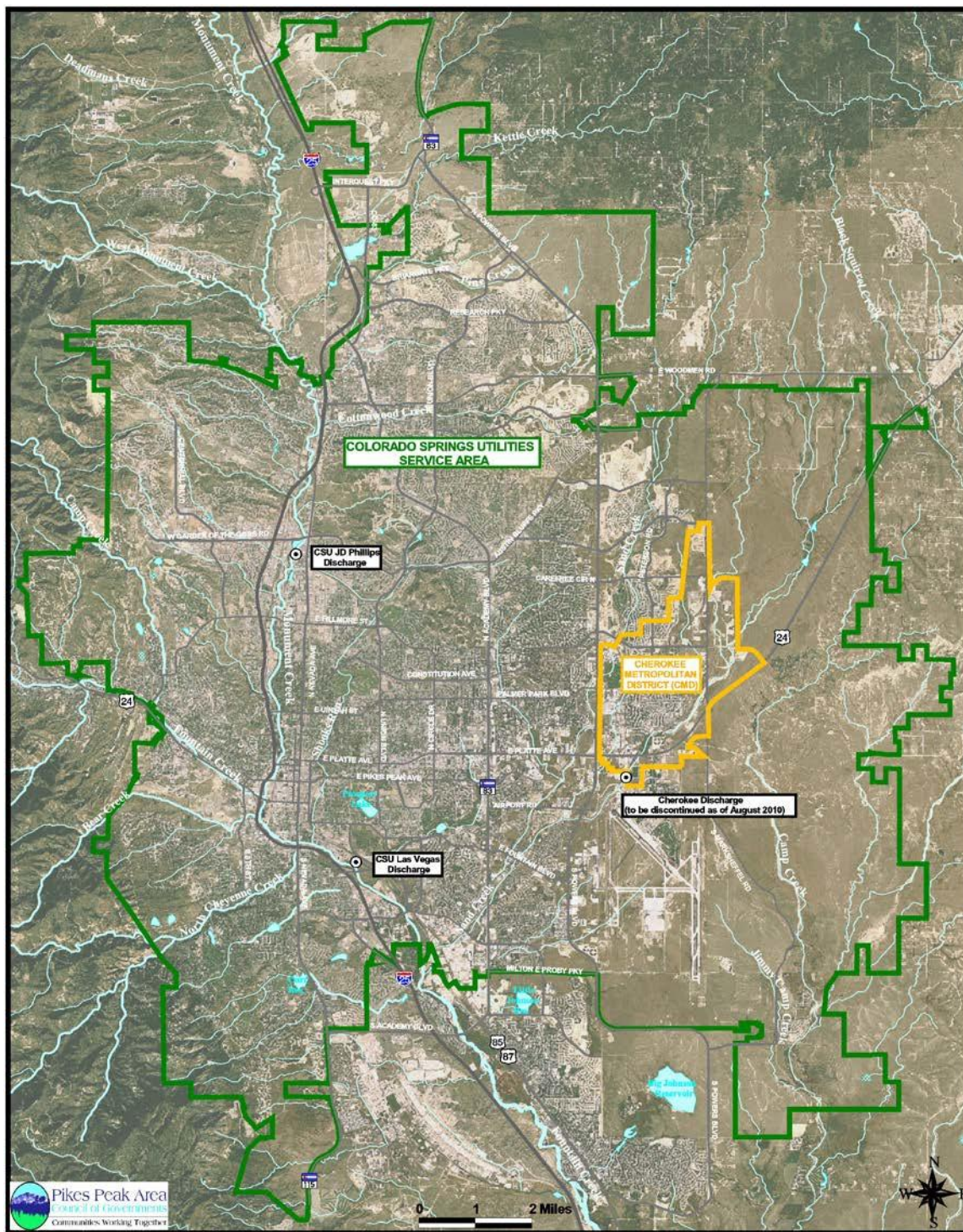
The LFMSDD planned, designed and constructed interceptor sewer and wastewater treatment facilities and commenced operation in 2013 receiving, treating and disposing of wastewater from the CCMD and FSD. The treatment facility is located south of Birdsall Road, east of Old Pueblo Road and discharges to an un-named tributary of Fountain Creek downstream of Calhan Reservoir and about 1.8 miles upstream from the mainstem of Fountain Creek. Approximately 61 percent of the wastewater generated in the FSD current (January 2019) service area is provided conveyance, treatment and disposal services by the LFMSDD.

As of January 2019, the LFMSDD operates its Harold D. Thompson Regional Water Reclamation Facility (HDTRWRF) with a rated capacity of 2.50 mgd providing for nutrient removal, both nitrogen and phosphorus. It is currently discharging about 1.01 mgd of treated wastewater to a tributary of Fountain Creek.

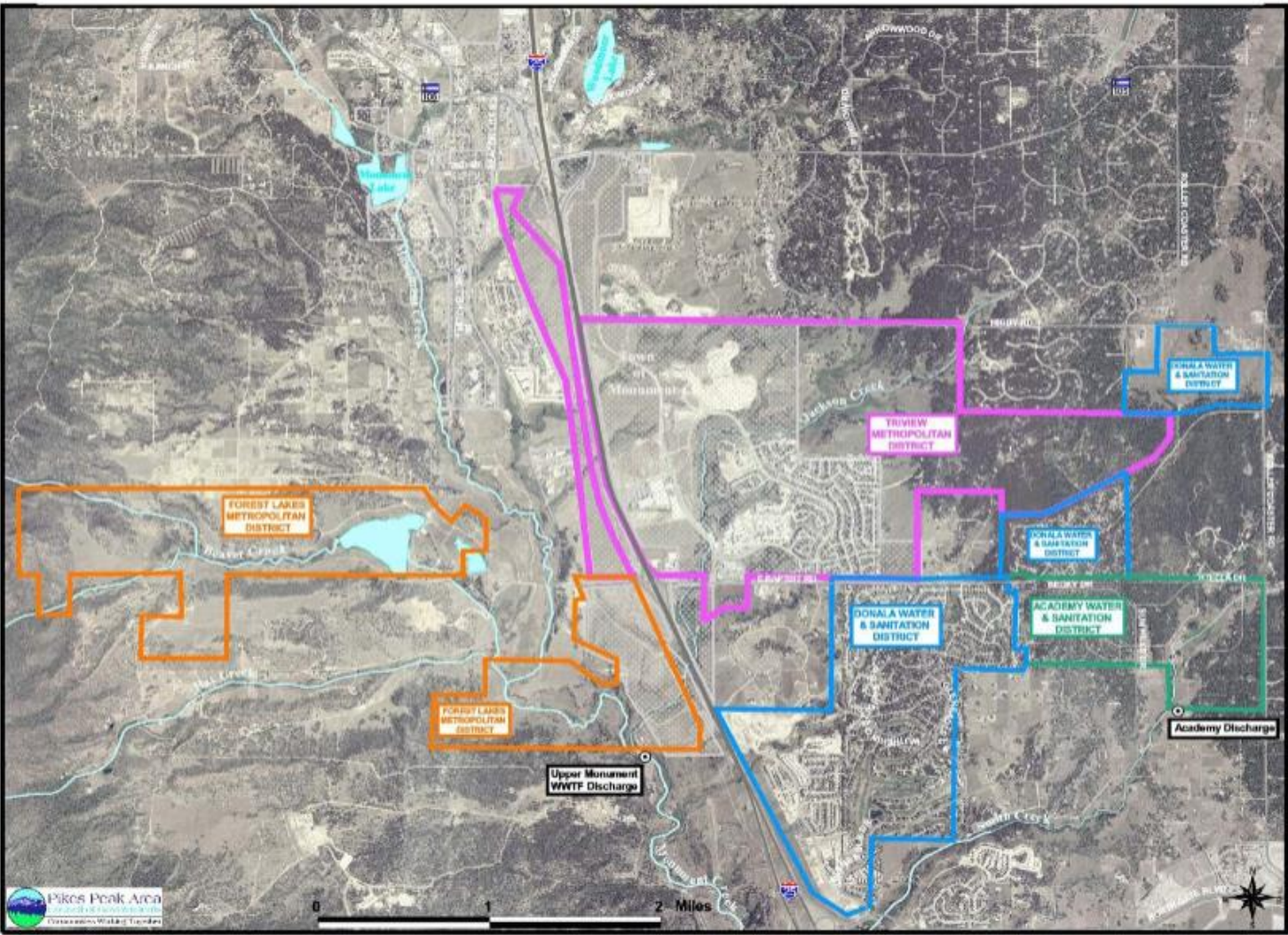
17.17. Major Point Source Service Area Maps

A summary of point source data is presented in Table 8, Appendix C which shows information obtained from the treatment facilities. Service area maps show projected service area boundaries for each facility previously described. The background of these maps is Google Earth satellite imagery which was last updated in September 2005. Major point source discharge locations are shown on the service area maps.

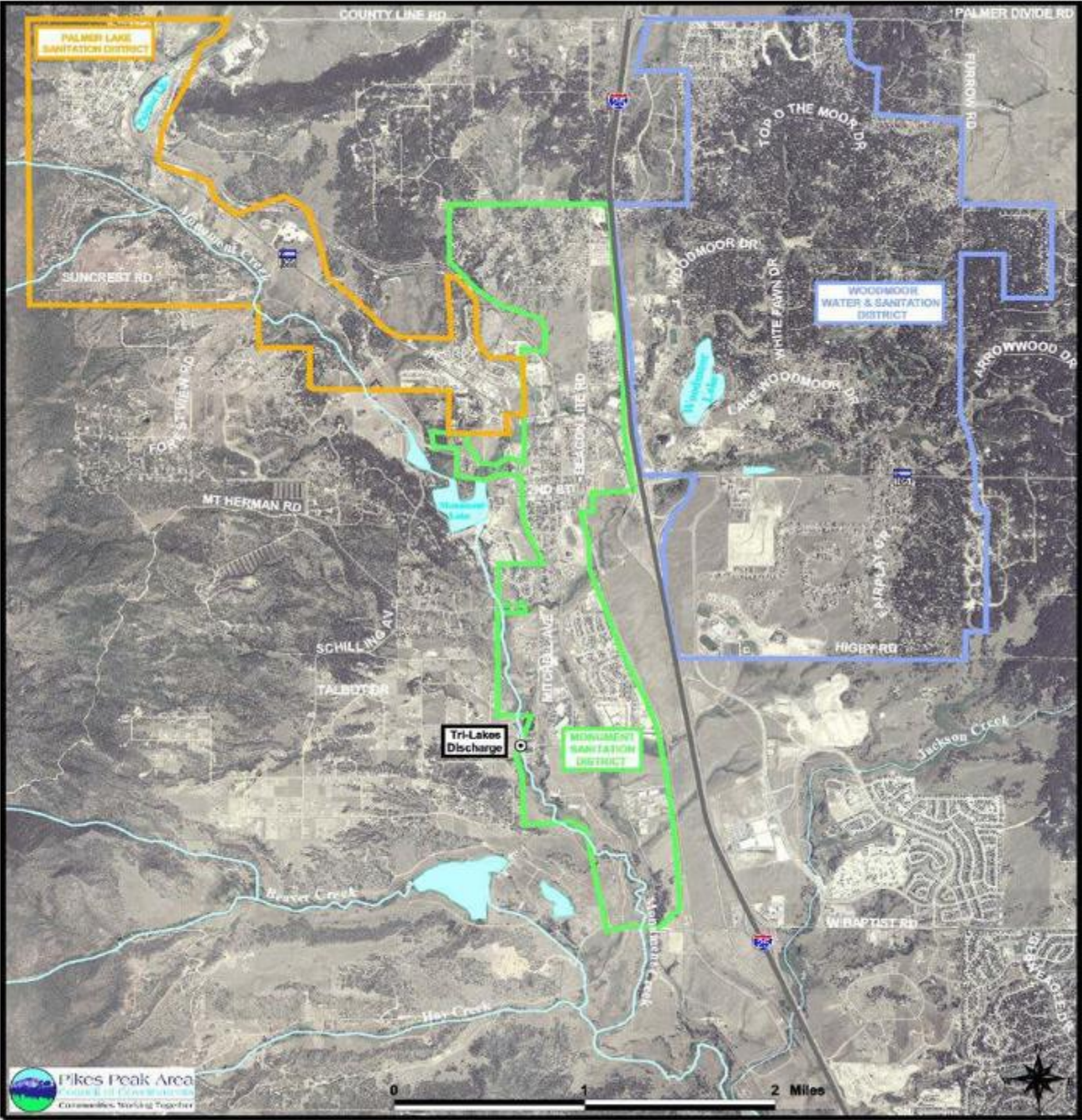
17.18. Figure: Colorado Springs Utilities Service Area



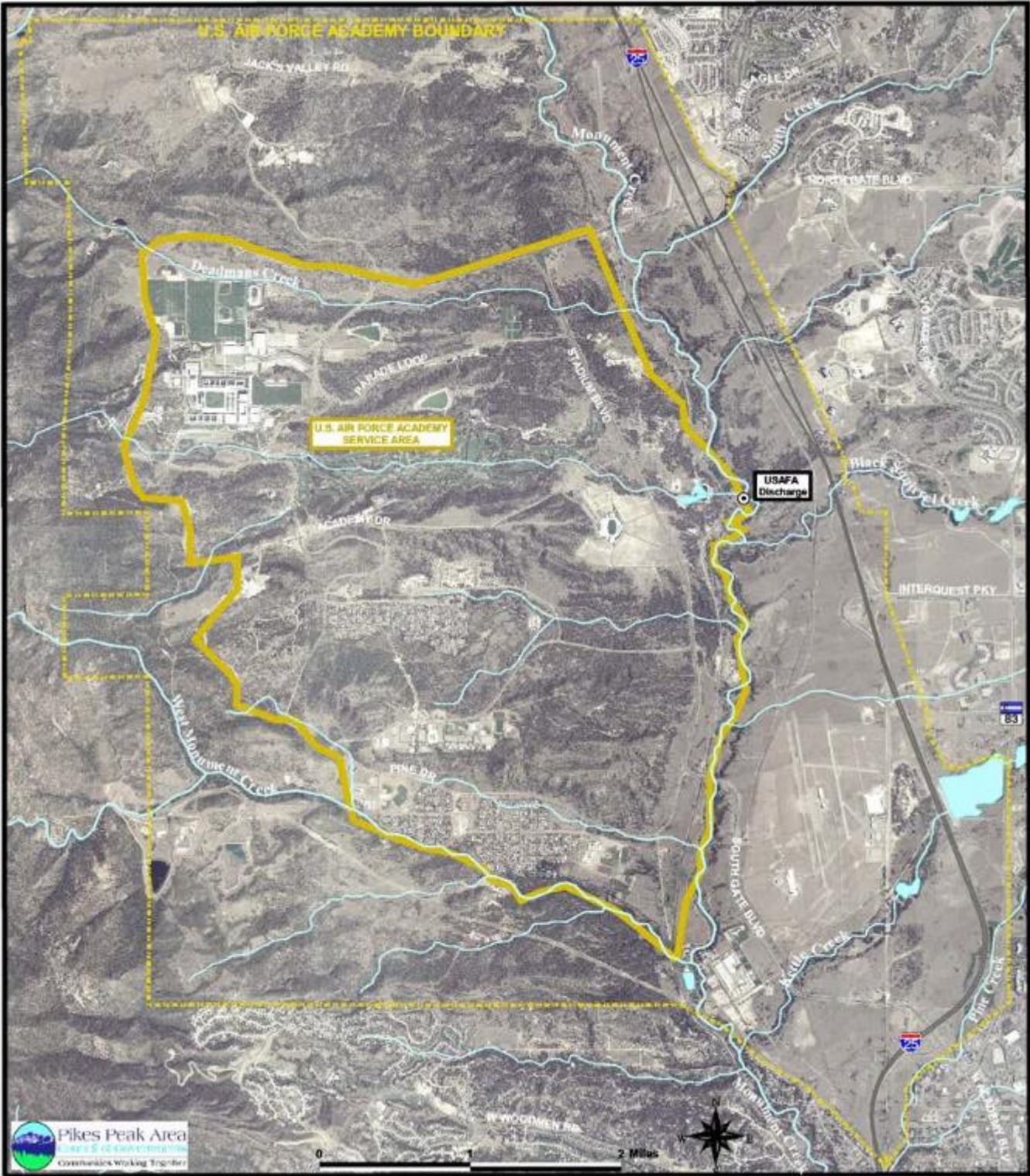
17.19. Figure: Academy Water and Sanitation District and Upper Monument Creek Regional WWTF



17.20. Figure: Tri Lakes Joint Use WWTF



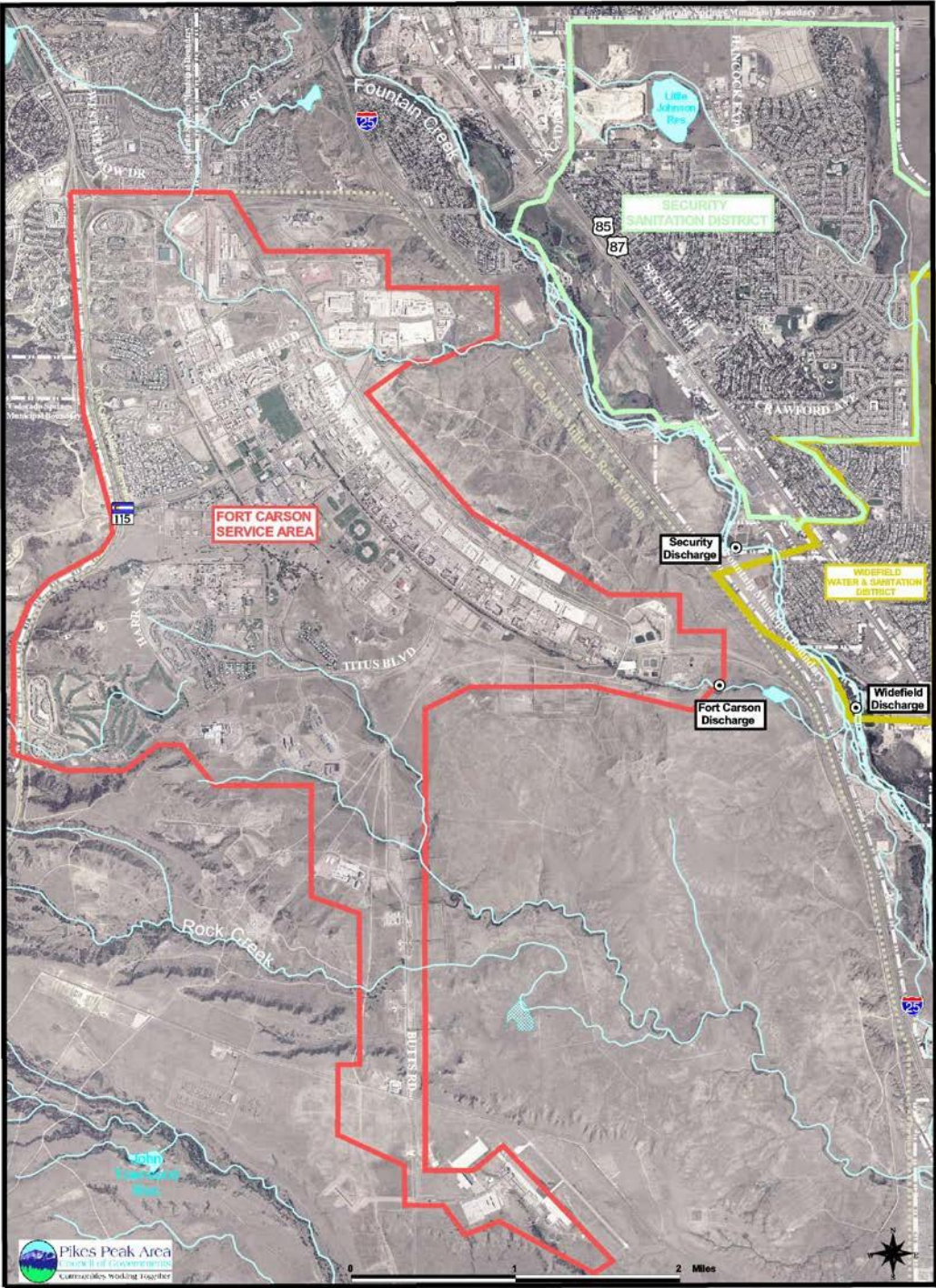
17.21. Figure: United States Air Force Academy



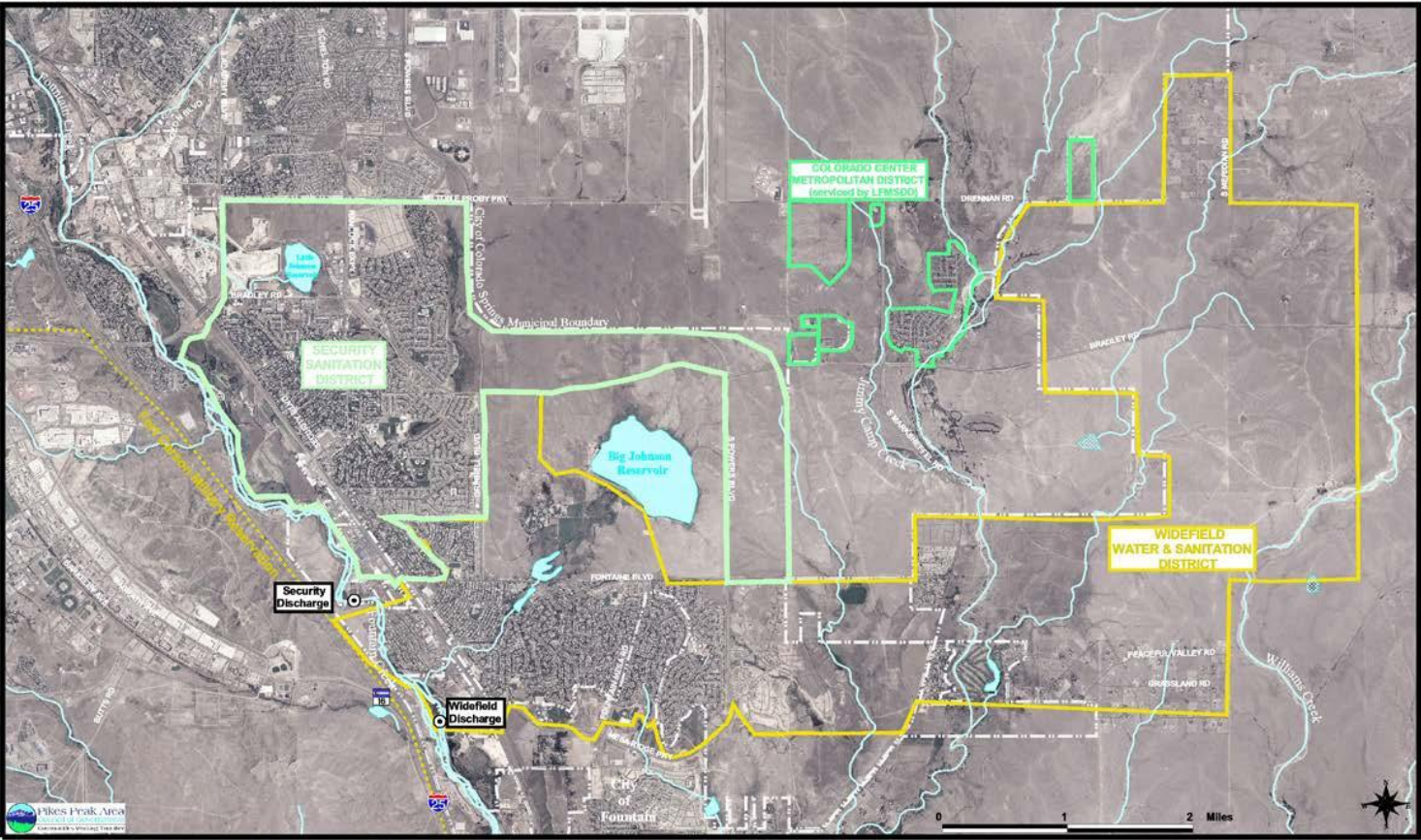
17.22. Figure: Cheyenne Mountain Estates – Broadmoor Park WWTF



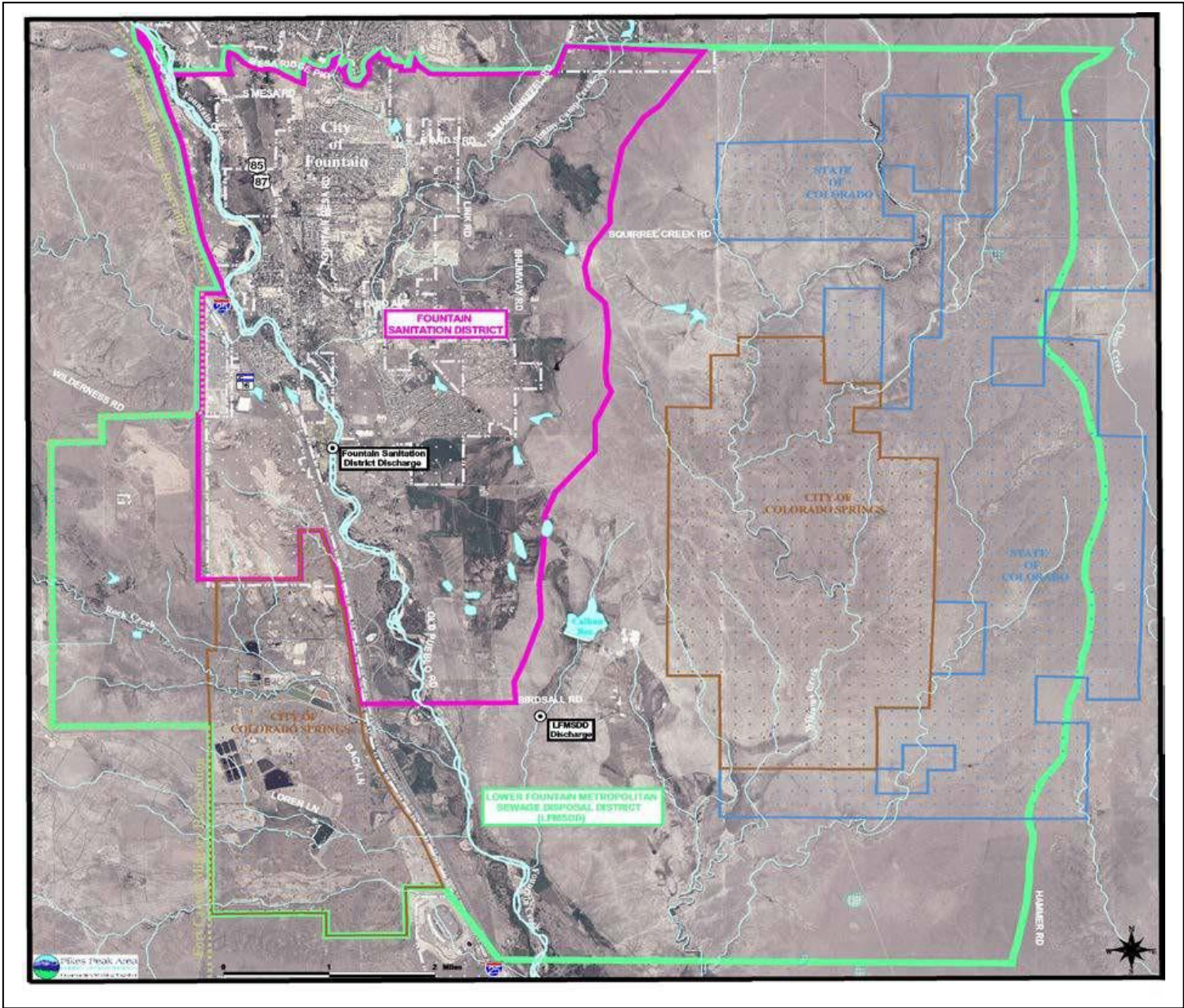
17.23. Figure: Fort Carson Service Area



17.24. Figure: Security Sanitation District and Widefield Water and Sanitation District Service Areas



17.25. Figure: Fountain Sanitation District and Lower Fountain MSDD



18. Nonpoint Source Assessment

This section will explain what the nonpoint source problems are and what is currently being done to control and mitigate their impact.

18.1. Agricultural Runoff

The most heavily impacted stream segments in El Paso and Pueblo Counties with respect to agricultural nonpoint source pollution are Fountain Creek Segments 2a and 2b. The two forms of agricultural nonpoint source pollution that are the most pervasive in Fountain Creek are total dissolved solids and sediment.

BMPs used to address total dissolved solids include the use of measures to increase the efficiency of irrigation water application and reduce irrigation water losses through seepage; collection and disposal of saline agricultural return flows; and desalination of drainage water from irrigated crop land. With regard to sediment, BMPs include the promotion of such techniques as contour cropping, strip cropping, field diversions, terracing, and waterway stabilization. These BMPs, along with others, are discussed in the Colorado's Nonpoint Source Management Plan (CDPHE-WQCD, 2012). The link to the plan can be found here: www.colorado.gov/pacific/cdphe/2012-nonpoint-source-management-plan Future projects will look at the possibility of developing pilot projects and grants to determine the effectiveness of these programs.

18.2. Resource Extraction

A past extraction area in the Fountain Creek Watershed with the potential to affect water quality is the former tailings pile for a gold refinery, referred to as Gold Hill Mesa, located just upstream from the confluence with Monument Creek. Ore from the mines in Cripple Creek and Victor were processed at this location. Gold Hill Mesa is located in Colorado Springs (El Paso County), and the Cripple Creek and Victor Gold Mining operations are located in Teller County. Gold Hill Mesa is 0.42 square miles in size and is located on the southern stream bank of Fountain Creek (Segment 1), between 8th and 21st Streets, approximately half a mile upstream from the confluence with Monument Creek. Gold Hill Mesa is being developed under an approved plan through the Colorado Voluntary Cleanup Program. The City of Colorado Springs approved a plan for a traditional neighborhood in the area with a soil cap over the tailings. Water quality monitoring performed by the USGS identified a source of trace elements exists between the monitoring stations located at 30th Street and 8th Street along Fountain Creek. These monitoring stations are upstream and downstream of Gold Hill Mesa,

respectively.

18.3. Urban/Stormwater Runoff

Although covered as a point source under MS4 stormwater permit requirements, urban runoff is a concern and can contain numerous pollutants from various sources. Driveways, streets, and parking lots are sources of oil, grease, and other materials from automobile operation and maintenance. Winter maintenance of roadways produces loadings of sand, salts, etc., that may be discharged to local streams. The desire for green lawns can result in excess fertilizer and pesticides running off and impacting water quality. Pet wastes and failing septic systems are sources of pathogens and pollutants such as nitrogen and phosphorus. Litter, debris, and occasional spills of chemicals used in commercial or industrial activities can be washed into streams.

Urban areas have greater impervious surfaces (roofs, streets, parking lots) to accommodate growth than do undeveloped areas where more infiltration into natural soils can occur. During precipitation events, flow greater than historical discharges and pollutants deposited on urban surfaces are more easily carried into streams. Historical flows in streams have shaped channels are most often significantly increased after development and therefore new channel shapes and sizes appear in reaction to the increased quantity and energy in the stream. In addition, Fountain Creek is a highly erosive watershed and naturally carries high levels of sediment, particularly during storm events. Excessive sediments can impair streams by depositing on stream bottoms and damaging spawning habitat (reducing fish survival and growth rates), impair fish food sources, and fill in pools and habitats important to aquatic life.

18.3.1. NPDES (National Pollutant Discharge Elimination System) Phase I

A Municipal Separate Storm Sewer System (MS4) Permit (COS-000004) was issued to the City of Colorado Springs and became effective on October 12, 1997. The city is currently under a third reissued permit that originally expired in 2016 and was administratively extended until the CDPHE re-issues the city's fourth permit. The City of Colorado Springs was the fourth city in Colorado to receive this permit.

The goals and concepts of this permit are:

- To the extent possible, evaluate impacts to the receiving waters and to tributary stream health from urban stormwater.
- Require the installation and maintenance of permanent BMPs for

larger developments.

- Implement a program to address stormwater runoff from construction projects.
- Establish and maintain programs associated with illicit discharge, public education, industrial facilities, and pollution prevention for municipal operations.

As part of the city's stormwater monitoring program, the city maintains an extensive water quality monitoring network on Monument Creek, Fountain Creek and significant tributaries.

18.3.2. NPDES (National Pollutant Discharge Elimination System) Phase II

In December 1999, the EPA promulgated the final Phase II NPDES stormwater regulation affecting cities/counties with populations between 10,000 and 100,000, and sites that have a maximum daily user population of at least 1,000 (Non-Standard MS4s). Permits for these communities in Colorado were initially issued in 2003. The Colorado Department of Public Health & Environment issued a General Permit for Stormwater Discharges Associated with MS4s. Phase II permits were reissued in 2008 to El Paso County, the City of Fountain, the City of Manitou Springs, the Town of Monument, the City of Pueblo, and Pueblo County. These communities, along with nonstandard (e.g., school districts and colleges) MS4 operators, are to have developed and implemented programs in six stormwater management areas:

1. Public education and outreach
2. Public participation and involvement
3. Illicit discharge detection and elimination
4. Construction site stormwater runoff control
5. Post-construction stormwater management
6. Pollution prevention/good housekeeping for municipal operations

The first Phase II permit term was March 10, 2003–March 9, 2008. The second permit term was March 10, 2008–March 9, 2013.

18.3.3. Drainage Criteria

The City of Colorado Springs and El Paso County *Drainage Criteria Manual* was developed in 1987 and revised in 1991 and 1994. The City of Colorado Springs has since updated this

manual to include City-specific criteria in 2002 and 2014. Subdivision regulations include performance standards for drainage and erosion control, as well as the requirement for drainage studies to be submitted with development plans.

The City of Colorado Springs Stormwater Advisory Committee acts as an advisory board to the City Council regarding subdivision codes and regulations relating to the drainage and control of flood and surface waters and the administration of subdivision storm drainage fees. The El Paso County Drainage Board acts as an advisory board and Board of County Commissioners regarding subdivision codes and regulations relating to the drainage and control of flood and surface waters and the administration of subdivision storm drainage fees.

Drainage basin boundaries are defined throughout El Paso County. Prior to development in a basin, a Drainage Basin Planning Study (DBPS) should be completed. A DBPS identifies drainage improvements for the future needs of the entire basin and estimates the costs for common improvements. Studies should be updated on an as needed. The most recent updates include the Jimmy Camp Creek DBPS (2015) and Cottonwood Creek DBPS (2019). An update to the Sand Creek DBPS is currently ongoing in the city.

The City/County Drainage Board, Colorado Springs City Council, and the El Paso County Commissioners must adopt each DBPS in their respective jurisdictions. A list of the Drainage Basin Planning Studies completed in the City of Colorado Springs is included at the website below:

<https://coloradosprings.gov/DBPS>

As part of a DBPS, the costs of needed major stormwater structures are estimated. Drainage fees are determined for each basin and collected from developers as property is platted so the costs are shared.

The city requires erosion control plans, and inspectors were hired in 2002 to monitor and enforce implementation. The county requires a drainage report and erosion control plan be submitted with the preliminary plan.

18.3.4. Streamside Overlay Ordinance

The Colorado Springs Streamside Ordinance was adopted by the Colorado Springs City Council in November 2002 and was modified in 2007. The ordinance is designed to protect the city's creeks and streams, and the ordinance regulates new developments within 100 to

200 feet of most waterways. This ordinance does not bar new development near streams but requires developments to be compatible with stream features. The ordinance precludes specific uses such as scrap yards, auto dealers, and parking garages from stream sides.

18.4. Construction Runoff

The two entities having the greatest concentration of storm drainage facilities and construction activity are the City of Colorado Springs and El Paso County. The potential for nonpoint source erosion-related impacts to Fountain and Monument Creeks is of significance based on proposed development. Major construction activity has occurred in the tributaries to Monument Creek east of the Air Force Academy, Cottonwood Creek, Sand Creek, and Jimmy Camp Creek sub-basins of the Fountain/Monument Creek drainage area. Construction runoff in these sub-basins may impact water quality in the mainstems of Monument and Fountain Creeks. Development is occurring in Black Squirrel, Kettle Creek and Middle Tributary basins to the northeast of Colorado Springs.

Requirements for controlling development-related erosion in the City of Colorado Springs are covered by both policy and regulation. This is detailed in the current City of Colorado Springs Drainage Criteria Manual, available at the following link:

<https://coloradosprings.gov/stormwater-enterprise/page/drainage-criteria-manual?mlid=6291>

Financial assurances for erosion control are required for larger sites whenever a grading plan is required to be submitted for review. Acceptable payment methods are posted in the Subdivision Policy Manual at the following link:

<https://coloradosprings.gov/public-works/page/engineering-criteria-manuals-references?mlid=6286>

El Paso County enforces erosion control plans and stormwater protection in unincorporated El Paso County. A performance bond is required for those items. Enforcement is also a problem with ordinances in Manitou Springs. A bond is not required, and the proposed improvements are often incomplete.

18.5. Onsite Wastewater Treatment Systems (OWTS)

Onsite Wastewater System (OWTS), also known as OWTS, include conventional septic systems and advanced treatment systems. The El Paso County Department of Health and Environment issues permits and inspects the installation of OWTSs.

OWTSs can provide good wastewater treatment if they are correctly designed, installed, and maintained. However, difficult soil conditions such as very rocky soils, high clay soils, or soils with a low permeability layer near the surface make the use of a conventional septic system challenging. In addition, poor maintenance, high water use, and old, undersized systems can cause OWTS failure. System failure can lead to contamination of surface water and/or groundwater.

Traditionally, maintenance of an OWTS was the responsibility of the homeowner, who may not be aware of the importance and the methods of OWTS protection and maintenance. The homeowner must recognize the importance of routine maintenance, especially regular septic tank pumping and not using more water than the system was designed to handle, as well as avoiding disposal of chemicals such as paint, bleach, oil, and grease through the wastewater system draining to the OWTS. The importance of knowing the locations of septic tanks, leach fields, vents, and piping must be stressed, and accurate records of system maintenance must be kept.

Regular inspection of a septic system is necessary, and the ability to require system inspection, repair, or replacement may be needed by local governments in order to assure the success of BMPs programs. Several options for this are in use in other parts of the country. Small utilities can provide inspection and maintenance services. Other utilities own the OWTS as well as providing services. Replacing OWTSs with sewer and centralized treatment is another option. In addition, a wide range of advanced treatment systems can provide additional treatment of the septic tank effluent before discharge to the leach field.

Improved maintenance of OWTSs begins with the education of homeowners concerning the limitations and basic operations of their systems. Homeowners need to be advised of the limited hydraulic capacity of an OWTS and of its inability to effectively handle certain substances such as caustic cleaning solutions and heavy loads of grease.

Homeowners must know proper techniques for monitoring system performance, as well as instruction in recognizing early warning signs of system failure. El Paso County routinely issues more OWTS permits per year than any other county in Colorado. It is estimated that 30,000 approved onsite wastewater systems were installed in El Paso County since 1966.

Communities do not have the organizational capacity to carry out a full-fledged program of education, inspection, and enforcement. PPACG is capable of providing direction for the educational elements of such a program but lacks the funding, authority, and capability to

perform inspections or to undertake enforcement actions. Some homeowners who know of deficiencies in their systems are reluctant to participate in a voluntary program. Renewable OWTS permits are now included in the 2007 revision of the Onsite Wastewater System Regulation, Regulation #43 and could be implemented if deemed necessary by the Board of Health.

Several alternatives were discussed regarding the best institutional form for implementing a program of BMPs for OWTS. The only general-purpose government having jurisdiction in the area with the authority to implement a mandatory septic tank maintenance program is the El Paso County Board of Commissioners. The CDPHE encourages local health departments to consider developing performance-based OWTS regulations in order to better protect water quality.

The El Paso County Department of Health and Environment is in contact with the El Paso Planning and Community Development Department and is encouraged by talks of “cluster-type” residential development. This type of development could potentially have covenants require periodic OWTS maintenance by residents. Programs that address the issues of failing onsite wastewater systems include a pilot program for licensing private firms to perform onsite wastewater system inspection, repair, and certification in lieu of the county health department; offering educational programs aimed at advising residents of water conservation and onsite wastewater systems maintenance techniques; and the temporary funding of an additional county environmental health specialist to initiate an inspection program.

El Paso County is conducting a study to determine the impacts, if any, of OWTS effluent on groundwater quality, especially in the shallow alluvial aquifer in the Upper Black Squirrel drainage basin. The groundwater study results are important not only for current water users but also for the El Paso County Planning and Community Development Department, and ultimately the Board of County Commissioners, in order to make informed development decisions within these areas. Phase I of the study was completed and Phase II is underway. If high nitrate levels associated with onsite wastewater treatment systems effluent are found, recent revisions to El Paso County regulations allow advanced treatment of onsite wastewater systems if deemed necessary to protect the health of the public. El Paso County’s subdivision regulations limit the creation of new lots with OWTSs to a minimum of 2.5 acres.

The CDPHE is currently in the process of OWTS guideline revisions that if approved will have an impact on local health department OWTS regulations. The primary focus of the guideline revisions is to establish OWTS performance standards dependent on soil conditions of the site

versus prescriptive standards that do not consider overall impacts on groundwater quality. All local health departments must revise their regulations within one year of the effective date of CDPHE guideline revisions.

18.6. Hydrologic Modification

Changes in a stream's flow regimes impact the stream's carrying capacity for sediment, increase eroding to stream banks, and affect water supply. Changes to the hydrologic regime occur through construction and operation of reservoirs and diversion ditches, check dams, riffle drop structures, and channelization of flows.

19. Water Quality Management Associations and Watershed Planning Groups

This section discusses wastewater operating agencies, management agencies/associations, and watershed groups/organizations in the Fountain Creek Watershed.

19.1. Wastewater Operating Agencies

The following organizations are recognized as wastewater operating agencies within the Fountain Creek Watershed. These agencies are responsible for controlling all aspects of the collection, treatment, and discharge of sewage or industrial concern, within their agency's sphere of operation. Each of these operating agencies is discussed in further detail in Section 8.3, Fountain Creek Watershed Point Source Dischargers.

- Academy Water and Sanitation District
- Cheyenne Mountain Estates–Broadmoor Park
- Colorado Springs Utilities
- Fountain Sanitation District
- Fort Carson
- Lower Fountain Metropolitan Sewage Disposal District
- Security Sanitation District
- Tri-Lakes Wastewater Treatment Facility (Monument, Palmer Lake, and Woodmoor Water and Sanitation District)
- United States Air Force Academy
- Upper Monument Creek Regional Wastewater Treatment Facility (Donala Water and Sanitation District, Forest Lakes, and Triview Metropolitan Districts)
- Widefield Water and Sanitation District

19.2. Management Agencies/Associations

Within the Fountain Creek Watershed, there are three existing Water Quality Management Associations (WQMA):

- Upper Monument WQMA
- Mid Monument WQMA

- Lower Fountain WQMA

WQMAs were formed under a Joint Powers of Agreement, and specific authorities were given to the management associations under section 208(c)(2) of the CWA. All existing WQMAs were incorporated between 1977 and 1987. Because of this, the traditional role of the WQMAs has been addressing point source rather than nonpoint source related problems and issues. Each WQMA has specific issues, policies, and planning activities based on the recommendations of the 208 Plan.

19.2.1. Upper Monument Water Quality Management Association (UMWQMA)

The Upper Monument WQMA was incorporated in December 1985 and meets bi-monthly to review and recommend actions on water quality issues pertaining to members, including the review of site applications in their area. The agency is also involved in the review of development projects, such as subdivisions that have the potential to impact water quality in its area. It is located entirely in the Monument Creek Subwatershed and borders Elbert and Douglas Counties to the north. Districts within the UMWQMA include Palmer Lake Sanitation District, Monument Sanitation District, Woodmoor Water and Sanitation District, Academy Water and Sanitation District, Donala Water and Sanitation District, Triview Metropolitan District, U.S. Air Force Academy, Town of Monument, and Town of Palmer Lake.

19.2.2. Mid Monument Water Quality Management Association

The Mid Monument WQMA incorporates most of the City of Colorado Springs urbanized area and is bordered by Upper Monument to the north, Lower Fountain to the south, Upper Fountain to the west, and eastern El Paso to the east. The City of Colorado Springs is the lead agency in the Mid Monument WQMA, and its relationship with other agencies is generally guided by contractual service agreements with the overlapping entities. It holds meetings on an as-needed basis.

19.2.3. Lower Fountain Water Quality Management Association (LFWQMA)

The Lower Fountain WQMA was incorporated in 1977 and meets monthly. This WQMA encompasses the southern portion of the Fountain Creek Watershed, which includes the mainstem of Fountain Creek. Entities within the LFWQMA include Fort Carson, Fountain Sanitation District, Security Sanitation District, Widefield Water and Sanitation District, Cherokee Metropolitan District, and the City of Fountain.

19.3. Watershed Groups/Organizations

19.3.1. Fountain Creek Watershed District

The Fountain Creek Watershed Flood Control and Greenway District (District) was established under Title 32 of the CRS. The boundaries, governance, powers, and duties of the district are established through this legislation. The district is governed by a Board of Directors consisting of a representative from El Paso County, City of Colorado Springs, City of Fountain, small municipalities in El Paso County, Pueblo County, City of Pueblo, Citizen of Pueblo County, Lower Arkansas Valley Water Conservancy District, and Community Advisory Group. A Technical Advisory Committee and Citizen Advisory Group provide input to the Board. The district is authorized to manage, administer, and fund the capital improvements necessary in the Fountain Creek Watershed to mitigate flooding, erosion, and sedimentation; address water quality issues; improve drainage; fund the protection of open space; and develop public recreation opportunities including open space. The district has land use authority in the 100-year floodplain on the mainstem of Fountain Creek, south of the City of Fountain in El Paso County, and north of the City of Pueblo in Pueblo County. Outside of this area, the District can provide input to public bodies on land use applications that have a direct or indirect impact to the watershed. The district has adopted the recommendations in the Army Corps of Engineers Study and Fountain Creek Watershed Strategic Plan. More information on these reports can be found at www.fountain-crk.org

19.4. Other Groups/Organizations and Authorities

19.4.1. El Paso County Water Authority/Pikes Peak Regional Water Authority

The El Paso County Water Authority was initially formed in 1997 to study groundwater quality and quantity and to explore future sources of water in the county. The El Paso County Water Authority includes municipalities and special districts located within El Paso County. The authority met on a monthly basis. The purpose of the report was to identify water demands, evaluate water sources to meet demands, identify issues in ability to meet demands, and provide recommendations to address issues.

19.4.2. Southeastern Colorado Water Conservancy District

(Note: the following text was taken from the website <http://www.secwcd.org/>.)

The Southeastern Colorado Water Conservancy District was created under Colorado State Statutes on April 29, 1958, by the District Court of Pueblo, Colorado, for the purpose of

developing and administering the Fryingpan- Arkansas Project. The District extends along the Arkansas River from Buena Vista to Lamar, and along Fountain Creek from Colorado Springs to Pueblo, Colorado. The District consists of parts of nine counties deriving benefits from the project.

The District is the legal agency responsible for repayment of the reimbursable costs of the project. In addition to administering this repayment responsibility, the District makes supplemental water from the Fryingpan-Arkansas Project available for use by approximately 280,600 acres of irrigated land under various private and mutual ditch companies, and for use by the many municipal and domestic water suppliers who directly serve the District's approximately 600,000 constituents.

The District is governed by a 15-member board representing the nine counties within the District. Each board member is appointed by the state's district court system. Director positions may also be elected if citizens petition the court for such an election. Members serve for four-year terms and are then subject to re-appointment.

19.4.3. Pikes Peak Regional Water Authority

The Pikes Peak Regional Water Authority was organized on January 10, 2007, through the adoption of an Intergovernmental Agreement executed by the members. Prior to its organization, the entity was known as the Palmer Divide Water Group. The Palmer Divide Water Group was dissolved upon the organization of the Pikes Peak Regional Water Authority. Like its predecessor, the PPRWA is a consortium of water providers serving the communities in northern El Paso County.

19.4.4. The Fountain Creek Watershed Flood Control and Greenway District

The Fountain Creek Watershed Flood Control and Greenway District was formed as a mechanism to implement several of the recommendations made through the Fountain Creek Corridor Study, which can be found at www.fountain-crk.org

19.4.5. The Fountain Creek Watershed Planning Group

The Fountain Creek Watershed Planning Group was formed as a committee of AF CURE in 2016 as a mechanism to address large-scale issues within the Fountain Creek watershed. In 2019, the group successfully completed an EPA Nine-Element Watershed-based Plan which focused on management of *E. coli* for the Fountain Creek watershed.

The plan can be found at: http://www.fountain-crk.org/wp-content/uploads/2019/07/FWC_E.Coli-Watershed-Plan_FINAL_03_29_19-1.pdf

20. Conclusions and Recommendations

20.1. Conclusions

Conclusions drawn from a review of this Fountain Creek Watershed section of the 208 Plan include:

- Additional wastewater treatment needs are minimal. Sufficient capacity already exists at most of the wastewater treatment plants.
- Population trends appear to reflect an increase in growth throughout the watershed, an increase in stormwater runoff, and an increase in discharge of treated domestic wastewater.
- Solutions should incorporate a regional approach and framework such as that established through the Fountain Creek Flood Control and Greenway District.
- Primary water quality issues of concern are *E. coli*, selenium and nutrients.

20.2. Recommendations

In September 2016, stakeholders from the Arkansas Fountain Coalition for Urban River Evaluation (AF CURE) formed a stakeholder group with the objective of developing a watershed plan to address excess nonpoint sources of *Escherichia coli* (*E. coli*) in Fountain Creek Watershed. The Fountain Creek Watershed-Based Plan was overseen by CDPHE, WQCD Nonpoint Source Program and funded by the Colorado Water Resources and Power Development Authority and AF CURE. The primary water quality parameter evaluated in this Plan is *E. coli*. To meet requirements associated with the Environmental Protection Agency's (EPA's) 9 Elements of a Watershed Plan, this Plan also identifies additional nonpoint source water quality issues in the watershed. The watershed plan recommends the following implementation strategies for proactive load reduction:

1. Human behavior changes
2. Resourcing existing or new programs, and
3. Infrastructure improvements.

Many stakeholders identified the primary E. coli sources of concern and has developed their own implementation plan including current efforts. The results from this plan's data analysis point to the need for additional data collection and analysis. One identified step is to verify locations and ages of onsite wastewater treatment systems throughout the watershed. This will be a large and resource-intensive effort and may require the review of active and inactive wells, mapping infrastructure, obtaining additional water quality data, at a minimum, and reviewing records. Additional next steps include reviewing all available data in the area, evaluating the potential for additional sampling locations in specific locations, and engaging additional appropriate stakeholders. Much of this work will require more resources, so exploring grant opportunities is also high on the implementation priority list.

The Fountain Creek Watershed EPA Nin-Element Plan for Management of E.coli can be found here: http://www.fountain-crk.org/wp-content/uploads/2019/07/FWC_E.Coli-Watershed-Plan_FINAL_03_29_19-1.pdf

Implementation of recommendations contained in the Fountain Creek Watershed Strategic Plan (2009) regarding water quality, sedimentation, and stormwater runoff; flooding and flood control; land use planning; recreation; wildlife; wetlands; agriculture; municipal water supply; and return flows should be considered. The general recommendations and project-specific recommendations regarding bank stabilization and ecosystem restoration contained in the Army Corps of Engineers Watershed Study should also be considered.

20.2.1. Sedimentation

Assist in developing appropriate stabilization threshold criteria for sediment in the watershed.

20.2.2. Riparian and Wetland Areas

Critical stream environment zones, floodplains, wetlands, and riparian areas should be protected through zoning or development regulations or acquired through conservation easements, land exchanges, transfer of development rights, or similar resource protection techniques.

20.2.3. Water Quality

Collaborate in the development of programs and policies to minimize impacts to water quality in the watershed. The Fountain Creek Watershed Environmental Protection Agency Nine-Element Plan for the Management of Escherichia Coli (http://www.fountain-crk.org/wp-content/uploads/2019/07/FWC_E.Coli-Watershed-Plan_FINAL_03_29_19-1.pdf) identified

next steps to help enhance water quality in the Fountain Creek watershed. One step is to verify locations and ages of OWTS throughout the watershed. Additional next steps include reviewing all available data in the area, evaluating the potential for additional sampling locations in specific areas of the watershed, and engaging additional appropriate stakeholders.

20.2.4. Onsite Wastewater Treatment Systems (OWTS)

Develop maps that overlay existing soil types, topographic features, small areas for leach fields, high water tables, and areas where poor and failed septic system problems have occurred.

Evaluate a mandatory participation program regarding OWTS inspection, repair, and replacement.

Develop an electronic tracking system for OWTS permits that includes location, age of system, size, soil stratigraphy, and depth to groundwater.

Evaluate districts where source water protection plans should be completed.

20.2.5. Permit Coordination and Review

Develop a timely procedure to review work planned within the floodplain and significant wetland areas so comments and feedback can be given on possible consequences. This can be conducted as part of the Army Corps of Engineers' 401 and 404 floodplain permitting process or as a part of a jurisdiction's grading and erosion-control permitting process. This procedure could be activated for areas identified as having either high erosion and instability problems or high-quality wetlands and for projects that will significantly affect creek flow rates and/or the creek route. The Army Corps of Engineers, the Regional Building Department, local governments, and Colorado Springs Utilities will work together to develop a review process to identify if issuance of a 401 and 404 permit, floodplain permit, and/or grading and erosion-control permit will impact existing high erosion and instability problems or high-quality wetlands or will significantly affect creek flow rates and/or the creek route.

20.2.6. Green Infrastructure

Host a Green Infrastructure (GI) workshop and develop a GI plan to develop better linkages between water quality, stormwater, transportation, and land use. By integrating disparate planning efforts, synergies can be increased and conflicts decreased between various groups and plans. Development of the plan will link different and sometimes conflicting resource issues and needs by creating solutions that benefit the entire watershed.

21. Chico Creek Watershed

21.1. Introduction and Overview

Chico Creek Watershed is about 736 square miles and is located in the southeastern portion of El Paso County and the northeastern portion of Pueblo County, immediately east of the Fountain Creek Watershed. The two main subwatersheds within the Chico Creek Watershed are Upper Black Squirrel and Chico Creek. Within the Upper Black Squirrel Sub-watershed, there are many existing districts, developed areas, and a number of major urban developments that were approved at the conceptual stage. Chico Creek Subwatershed consists of large farms and has several unique ecosystems. Both of these areas are included in the South Central Comprehensive Plan, which is a small area element of the El Paso County Master Plan.

21.2. Land Use

The Upper Black Squirrel Subwatershed is primarily a rural area that consists of existing and proposed small clusters of single-family homes, and between these clusters it is primarily rural in nature. The established subdivision and development patterns are expected to remain the same except for the possible redevelopment of certain parcels with lower density uses, especially next to major intersections. Major growth is also limited to areas where services, including roads, can be provided.

The primary land use in the Chico Creek Subwatershed is agriculture/farming followed by residential. The Colorado State Land Board is the largest single landowner in the Chico Creek Subwatershed. The Land Board owns about 215,000 acres of land (about half of the total watershed area) in the Chico Creek Basin and 260,000 acres of mineral rights. Since 1994, the Land Board has:

- Acquired 75,000 acres of shortgrass and sand sage prairie;
- Designated 90,000 acres in the Stewardship Trust; and
- Issued two 25-year leases for ranches (Chico Basin, Bohart, and Frost Ranches) encompassing over 20,000 acres that encourage educational and conservation efforts.

The major goal of these acquisitions was to assemble large contiguous properties that could be managed more effectively than the 640-acre sections of trust lands typically found on the eastern plains. The two largest contiguous parcels which the Land Board owns are the Chico Basin and Bohart Ranches.

21.3. Population and Socioeconomic Characteristics

Growth of the Colorado Springs Metropolitan Area is causing a trend towards rural expansion into both subwatersheds. Existing and proposed development in the Upper Black Squirrel Subwatershed includes the Ellicott Springs/Sunset Village area, Ellicott School, Woodmen Hills, Meridian Ranch, Viewpoint Village, Springs East, Paint Brush Hills, Falcon Highlands, Falcon Hills, and other subdivisions in the Falcon area. El Paso County Planning and Community Development is coordinating future planning along the Highway 94 corridor.

Within the watershed, along eastern and southern portions of the county not owned by the state, there's a trend towards 35-acre developments. This is important since parcels of 35 acres or greater are exempt from local subdivision control and do not have specific regulations, requirements, and fees. This includes requirements to demonstrate a 300-year water supply, to have road access and appropriate building sites, and to pay fees toward school and parkland, drainage, and possibly traffic impacts.

In the Falcon/Peyton planning area, "In 1992, about 31% of the land area was made up of parcels over 640 acres, and now that size parcel makes up only about 22% of the area. In contrast, parcels smaller than five acres made up only about 3% of the planning area in 1992, while now these parcels occupy almost 10% of the planning area. Perhaps most telling, the number of parcels under five acres in size increased by 551%. This clearly points to a trend of subdivision and urbanization." (El Paso County, 2008, p 2-48)

21.4. Characterization of Watershed Issues

21.4.1. Upper Black Squirrel Subwatershed

The primary watershed issues are associated with the trend toward urbanization or suburban development and related issues, especially in the northern portion of the Upper Black Squirrel Subwatershed. This trend, when coupled with lack of regulatory control on lots of 35 acres or greater, problems associated with water quality, erosion, and sedimentation can have a compounding effect on water quality. Groundwater quality could be impacted from an increased reliance on onsite wastewater systems instead of centralized wastewater treatment. Many of the homes and communities in this area rely on groundwater, and depletion of groundwater resources could threaten the biodiversity and availability of water in the area. An adequate supply of groundwater is critical to a healthy and sustainable system.

21.4.2. Chico Creek Subwatershed

In the Chico Creek Subwatershed, overgrazing and grazing along streams/creeks is an issue, although several of the ranches in this area are taking proactive steps to minimize possible impacts. Ranches in this area have developed a community-based conservation and direct marketing network that supports a diverse enterprise mix of traditional and nontraditional ranch products. Examples of this can be found at www.chicobasinranch.com.

An assessment by the Chico Basin Conservation Leadership Initiative (2002) revealed a high-quality and biologically diverse arid landscape, intrinsically valuable with a historic agricultural economy. The study concluded the area was:

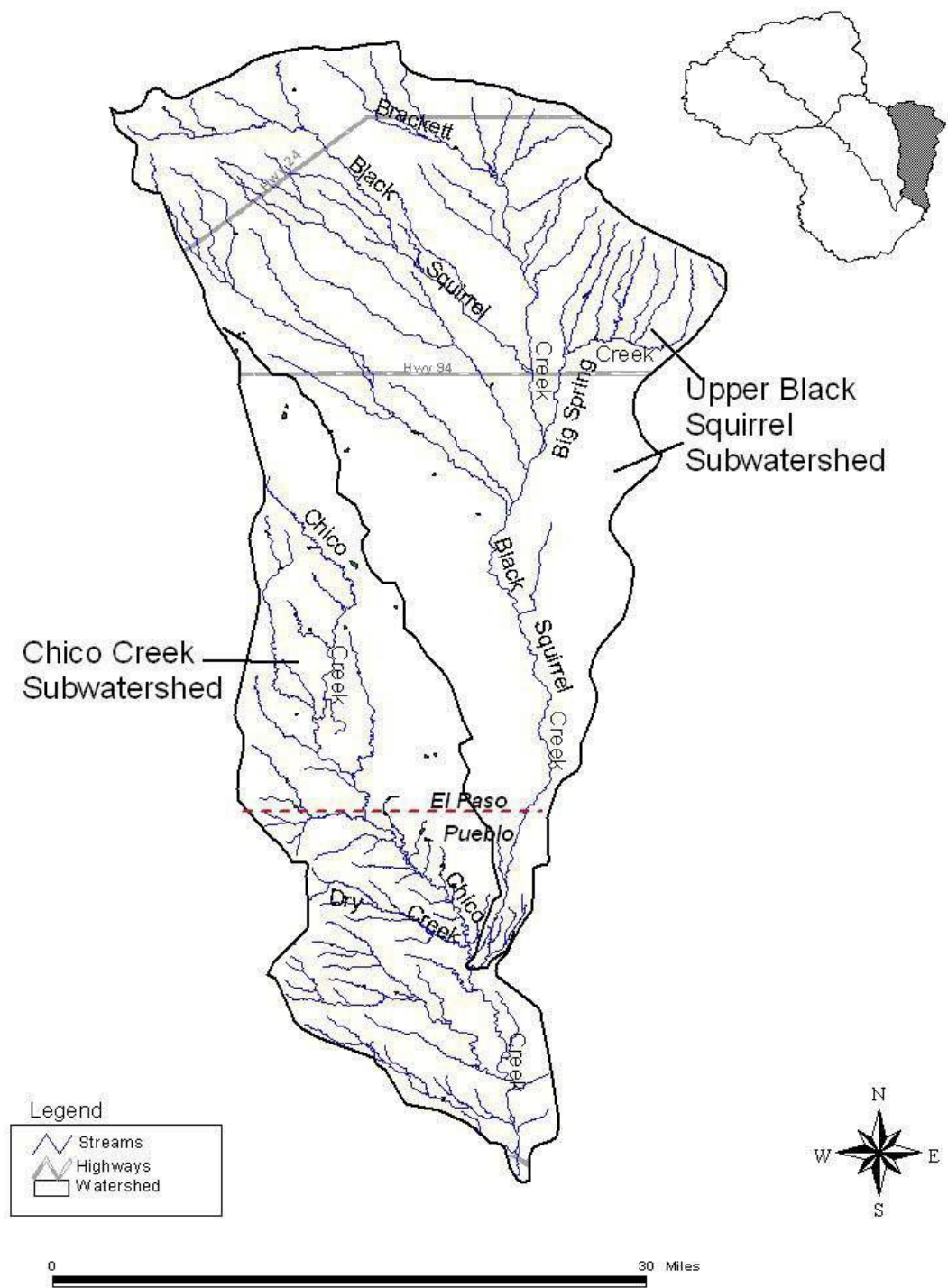
- Threatened by fragmentation, economics of development, lack of vision and action, and loss of water due to increased diversions and growth-related use; and
- Alternatives to development are needed to increase value of land due to residential growth, fragmentation, and increasing demands on finite water supplies.

21.5. Overview of Watershed Activities

- Activities completed in the watershed are listed below:
- Chico Basin Conservation Leadership Initiative is meeting under the organization of the Nature Conservancy. This leadership initiative was a follow-up from the Chico Basin Symposium held in February 2002 to discuss issues ranging from “The Ecological Importance of the Chico Basin” to “Economics of Ranching in the Chico Basin.” Some goals of this group were to identify and engage local leadership in conservation issues.
- Highway 94 Master Plan—This plan was developed in 2003 (El Paso County) and is used as a guide for future county actions concerning land development requests along Highway 94.
- Falcon/Peyton Small Area Master Plan (El Paso County, August 2008).
- El Paso County Strategic Plan (December 2017)

- El Paso County Land Development Code is frequently updated

21.6. Figure: Chico Creek Watershed Reference Map



21.7. Watershed Water Quality Analysis

21.7.1. Standards and Classifications

Within the Chico Creek Watershed, there are only two stream segments - COARMA04c and COARMA04f:

21.8. Table: Water Quality Stream Segments

	Stream Segment Description	Classifications	Physical & Biological	Inorganic (mg/l)		Metals (ug/l)
4c.	Mainstem of Chico Creek, including all tributaries, wetlands, lakes, and reservoirs, from the source to the confluence with the Arkansas River	Aq Life Warm 1 Recreation E Agriculture	D.O. = 5.0 mg/l pH = 6.5-9.0 E. coli = 126/100ml	NH3(ac/ch) =TVS CL2(ac)=0.019 CL2(ch)=0.011	CN=0.005 S=0.002 B= 0.75 NO2= 0.05	As(ac) = 340; As(ch)= 7.6 (Trec); Cd(ac/ch) = TVS; CrIII(ac/ch) = 100(Trec); CrVI(ac/ch) = TVS; Cu(ac/ch) = TVS; Fe(ch) = 1000 (trec); Pb(ac/ch) = TVS; Mn(ac/ch) = TVS; Hg(ch) = 0.01(tot); Ni(ac/ch) = TVS; Se(ac/ch) = TVS; Ag(ac/ch) = TVS; Zn(ac/ch) = TVS
4f.	Mainstem of Black Squirrel Creek, including all tributaries and wetlands, from just below Highway 94 to Squirrel Creek Road,	Aq Life Warm 2 Recreation P Agriculture	D.O. = 5.0 mg/l pH = 6.5-9.0 E.Coli= 205/100ml Temperature WS-III Chlorophyl a (mg/m2) 150		CN=0.2 B= 0.75 NO3=100 NO2=10 P=0.17	As(ch)=100(T); Be(ch)=100(T); Cd(ch)=10(T); CrIII(ch)=100(T); CrVI(ch)=100(T); Cu(ch)=200(T); Pb(ch)=100(T); Mn(ch)=200(T); Mo(ch)=150(T); Ni(ch)=200(T); Se(ch)=20(T); Zn(ch)=2000(T) Uranium varies
Temporary modification (type iii): NH3(ac/ch) = Existing Quality Expiration date: 12/31/2011. Since December 2006, PBHMD has been conducting a use attainability analysis (UAA) of Middle Arkansas Segment 4c, also identified as segment COARMA04c. Preliminary UAA data analysis results indicate the current segmentation, classification, and water quality standards may not be accurately representative of actual site-specific conditions.						

21.9. Surface Water

Within the Chico Creek Watershed there are two main creeks: Black Squirrel Creek, and Chico Creek.

Black Squirrel Creek originates in Black Forest in northern El Paso County and drains into Chico Creek in Pueblo County. Chico Creek then flows into the Arkansas River in Pueblo County. The upper and middle portions of Black Squirrel Creek and Chico Creek are ephemeral streams that flow only in response to thunderstorms, snowmelt, and prolonged rainfall. There is perennial flow only along the lower portions of Black Squirrel Creek and Chico Creek.

Fishery data collected by the Colorado Department of Parks and Wildlife between 1993–1998 along the lower portions of Black Squirrel Creek and Chico Creek indicate the presence of the Arkansas Darter (state endangered fish). Nine fish species were also present in this drainage, but not all were found at each site; seven of these species are native to the Arkansas River basin. The fish species were not equally abundant at all the monitoring sites. This monitoring data indicate this section is not impaired and the fish community is abundant, diverse, and relatively stable.

21.9.1. Monitoring

Because most of the stream segments in the Chico Creek Watershed are ephemeral, there are currently no monitoring stations located in the watershed. Water quality monitoring data is therefore extremely limited. Future studies should investigate the possibility of a monitoring station on Chico Creek, immediately above the confluence with the Arkansas River.

21.10. Regulatory listing

There are no segments within the Chico Creek watershed on the 303(d) list or the 303(d) Monitoring & Evaluation list.

21.11. Groundwater

Groundwater accessed through individual wells is the primary source of drinking water for residents living in this watershed and to the east of this watershed. Because of the limits of surface water in this region (lack of year-round surface water or reservoirs), groundwater also plays a critical role in determining the type and magnitude of future growth and development. The primary concern is groundwater in the Upper Black Squirrel alluvial aquifer, which underlays most of the Chico Creek Watershed.

Denver Basin Aquifers

The Denver bedrock aquifers discussed in section 8.2.4 are the primary sources of groundwater. Because of the nature of the strata (the confining units between the saturated beds), the Denver Basin aquifers are not considered to be a long-range, renewable source of water (El Paso County, 2008). An overview of the characteristics is provided in Table 21.12.

21.12. Table: Denver Basin General Aquifer Characteristics

Aquifer Name	Aquifer Top	Aquifer Thickness	Depletion Speed ¹	Water Treatment ²
Dawson	Land Surface	0–450 feet	High	Normally none
Denver	0–660 feet	350–900 feet	High to Moderate	Rare
Arapahoe	380–1530 feet	500–600 feet	Mod to Low	Usually
Fox Hills	1200–2300 feet	200–340 feet	Low	Sometimes

¹ Determined by the amount of pumping past and present and with future projections

² In most cases, the amount of iron and manganese determines the need for treatment.

Upper Black Squirrel Alluvial Aquifer

The Upper Black Squirrel Creek alluvial aquifer underlies about 350 square miles of the Upper Black Squirrel Creek Subwatershed. This aquifer is located about 25 miles east of Colorado Springs and supplies water for domestic, agriculture, and municipal uses. The Water Quality Control Commission has assigned use classifications and water quality standards to this aquifer (CDPHE-WQCC, 2009) as shown below:

- Specified Area: All unconfined groundwaters within the saturated zone underlying specified area of El Paso County.
- Classification: The classifications of the unconfined ground water in the specified area are: 1) Domestic Use-Quality; and 2) Agricultural Use-Quality.
- Ground Water Quality Standards
- 1-4 of the *Basic Standards for Ground Water* (CDPHE-WQCC, 2009) are assigned to all unconfined groundwater in the specified area.

The Colorado Groundwater Commission administers water withdrawals from this aquifer, and

the Upper Black Squirrel Creek Groundwater Management District that was established in 1968 by the Colorado Groundwater Commission who reviews water rights applications and information concerning withdrawals for this basin. This district is authorized to adopt additional rules and regulations to help administer groundwater within their district. The boundaries of the District and the aquifer are the same.

The aquifer supplies most of the water for irrigation and domestic use in the basin, and since 1964, it supplies water for export to the Colorado Springs area. This alluvial aquifer is also used as a drinking water source for Cherokee Metropolitan District. Water exported by Cherokee from this aquifer is considered transbasin water and is available under the Colorado Water Law to be used to extinction. Cherokee completed construction and commenced operation of a new WRF for recharging the aquifer in a manner augments available groundwater resources. The treatment plant began operations in July 2010.

Colorado Geological Survey Studies

In January 2012, the U.S. Geological Survey, in cooperation with the Pikes Peak Area Council of Governments, Colorado Department of Public Health and the Environment, Colorado Springs Engineering, and Colorado Springs Utilities, published “Evaluation of Fecal Contamination by Human and Ruminant Sources in Upper Fountain Creek, Colorado, 2007–2008, By Using Multiple Lines of Evidence”. The study was conducted to document the locations, magnitude, and sources of fecal contamination to upper Fountain Creek. The objective of this study was to identify major sources of *E. coli* in upper Fountain Creek during exceedances of the State recreational water standard. To meet this objective, a new approach was developed and tested that uses genetic marker analysis for microbial source tracking, along with other information, to evaluate potential contributions of fecal contamination from various sources. The full report can be found at: <https://pubs.usgs.gov/fs/2011/3095/>

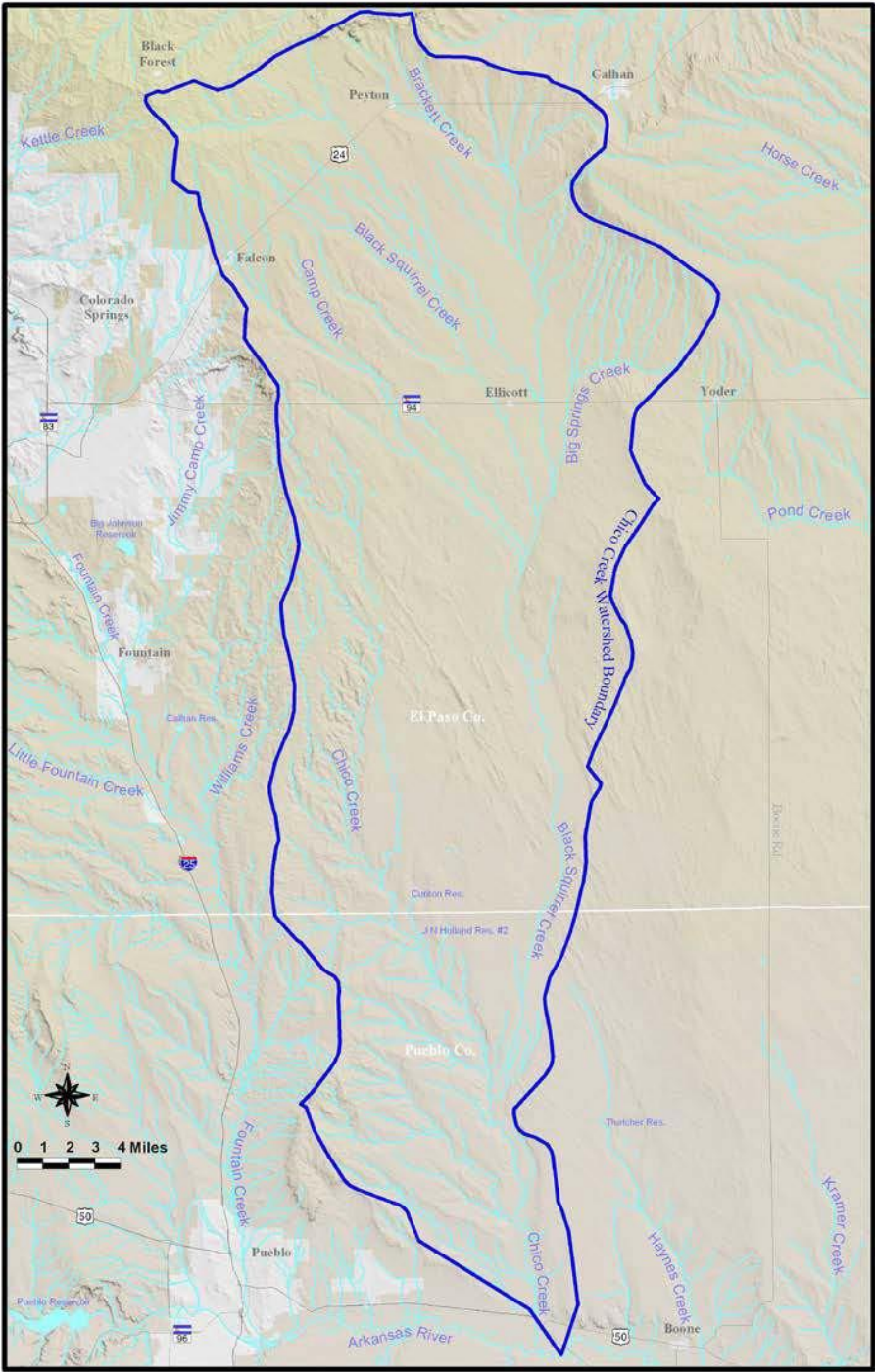
Highlights from this report include:

- The initial *E. coli* survey at 16 sites in 2007, identified the location where Ruxton Creek enters Fountain Creek as a pivotal point in the watershed. At this location, Fountain Creek often changed from achieving to failing to achieve Colorado’s standard for in-stream *E. coli* density. Ruxton Creek accounted for some, but not all, of the fecal contamination at this point.

- During the cool season (September 16 through June 14), MST marker analysis did not exclude any of the evaluated animals (human, ruminant, pet, bird, other nonruminants) as potential sources of fecal contamination. However, because the levels of *E. coli* were generally below the standard during these months, the presence of fecal contamination from any of these sources did not exceed regulations. However, during warm season, MST marker analysis indicated humans, ruminants, and pets (cats and dogs) were not the source of excessive *E. coli* (relative to the standard). Birds were the only evaluated source that could have contributed this much *E. coli* without being detected by MST genetic markers.
- The general lack of wastewater associated chemicals in the water samples during the warm season supported the finding that humans or ruminants were not the primary cause of fecal contamination to upper Fountain Creek. The indication that birds were a probable source of *E. coli* contamination during warm season was supported by the data collected. In water samples collected during the warm season and in bird-feces samples, high concentrations of *E. coli* were present but the general-feces MST marker concentration was low relative to other potential fecal sources and human and ruminant-associated markers were absent.

In September 2017, the U.S. Geological Survey, in cooperation with Colorado Springs City Engineering published “Characterization of water quality and suspended sediment during cold-season flows, warm-season flows, and stormflows in the Fountain and Monument Creek watersheds, Colorado, 2007–2015”. The study was conducted in the Fountain and Monument Creek watersheds to characterize surface-water quality and suspended-sediment conditions for three different streamflow regimes with an emphasis on characterizing water quality during storm runoff. Data collected during this study were used to evaluate the effects of stormflows and wastewater-treatment effluent discharge on Fountain and Monument Creeks. The full report can be found at: <https://pubs.usgs.gov/sir/2017/5084/sir20175084.pdf>

21.13. Figure: Chico Creek Watershed Stream Locations



21.14. Point Source Dischargers

21.15. Overview

The Chico Creek Watershed is divided into two main subwatersheds, Upper Black Squirrel and Chico Creek. There are many development projects in Upper Black Squirrel Subwatershed that are either recently completed, in the initial planning stages, or delayed due to the slowdown in economic activities and housing. Water rights issues and the ability to provide water service to these districts have and will continue to play a critical role in these developments.

In July 2010, the Cherokee Metropolitan District has completed and began operation of a new Water Reclamation Facility to relocate their wastewater operations into this subwatershed.

All wastewater treatment facilities are located in the Upper Black Squirrel Subwatershed and there are currently no permitted facilities in the Chico Creek Subwatershed. No industrial discharge facilities are located in either of these subwatersheds.

There are also two wastewater treatment facilities located in El Paso County, but outside of the Upper Black Squirrel Subwatershed:

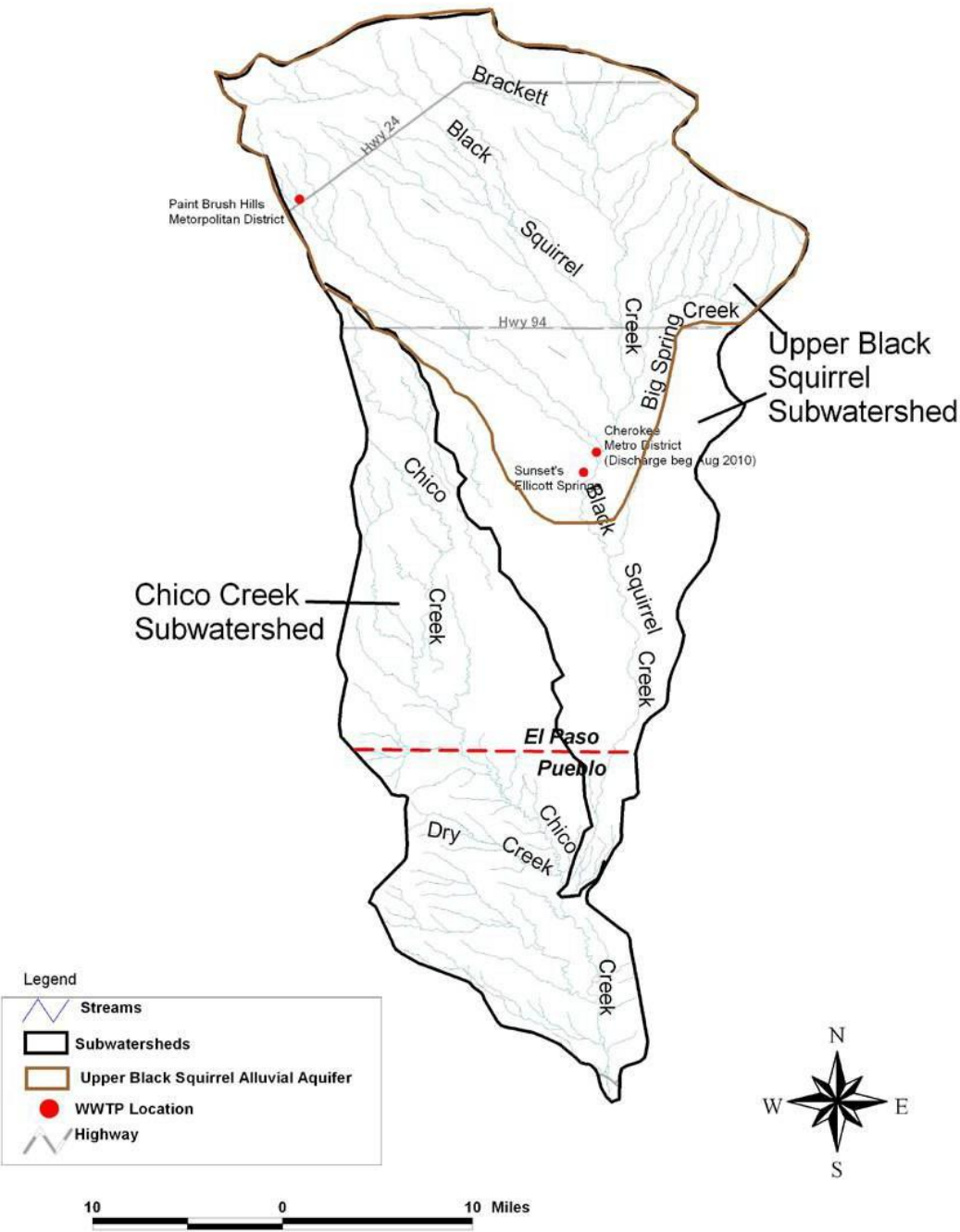
- Town of Calhan is located northeast of the Watershed along Highway 24
- Walden Corporation is located northwest of the Watershed.

21.16. Table: Chico Creek Watershed Major Point Source Discharge Facilities

Wastewater Treatment Plant	Permit No.	Discharge Location	Proposed Mgmt. Area	Design Capacity (mgd)	Existing Load (mgd)	Permit Expiration Date
Woodmen Hills Metropolitan Dist. RWRF	CO-0047091	Unnamed tributary of Black Squirrel Creek, east of treatment plant (Water Reclamation Facility and rapid infiltration basins)	Upper Black Squirrel	1.3	0.775	Expired in December 2019. Operating under administrative extension until the new permit is issued.

Cherokee Metropolitan District	COX048348	Discharge to groundwater (ten recharge basins were constructed at the site)	Upper Black Squirrel	4.8	1.8	Renewed in July 2015. Expires July 31, 2023
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21.17. Figure: Chico Creek Watershed Point Source Discharger Facilities



21.18. Highway 94 Comprehensive Plan

El Paso County completed the last update of the Highway 94 Comprehensive Plan, which was originally adopted by the El Paso County Planning Commission in 1985 and updated in July 2003. The planning area includes approximately 120 square miles–100 square miles centered around Schriever Air Force Base, and another 20 square miles centered around the Colorado Centre area. This small area plan element is used as a guide for future Board of County Commissioners' actions concerning land development requests. This document acknowledges wastewater treatment as a significant planning parameter affecting the area. The plan acknowledges pressures for urban density development along State Highway 94 and also recognizes the substantial up-front costs associated with constructing new wastewater treatment plants for such developments.

The Highway 94 Plan addresses the issue by acknowledging possible development scenarios, which include:

- Connections to the Sunset Village Treatment Plant (Ellicott Springs Resources LLC), southeast of the planning area, and possible enlargement of the facility.
- Connections to the Cherokee Metropolitan District Water Reclamation Facility
- Use of a “package plant” as a start-up option, although a package plant would face substantial regulatory barriers.
- Siting and construction of a new sewage treatment plant in the planning area in the same vicinity as the Sunset Plant (Ellicott Springs Resources LLC).

21.19. Future Needs Assessment

The future needs assessment described in this section is based on proposed growth and development expected to occur in the Upper Black Squirrel Subwatershed and what effects this will have on wastewater treatment plant service needs. Growth pressure has become significant within the basin. The Woodmen Hills, Meridian Ranch, Falcon Highlands, Paint Brush Hills, and other areas have experienced significant development since the 2010 update of the 208 Plan, including both residential and commercial activities. Several factors will be critical in determining future needs for this area. These factors include:

- Water resource availability: Future development must demonstrate a reliable source of water.
- Cost: Development of services should consider the most cost-effective manner possible.
- Environmental constraints and water quality: Possible environmental constraints and ability to treat effluent according to CDPS and NPDES permit standards.

21.19.1. Cherokee Metropolitan District

Water Reclamation Facility (WRF)

The Cherokee Metropolitan District currently owns and operates a publicly-owned wastewater treatment plant located at the northeast corner of the intersection of Milne and Drennan Roads within the Upper Black Squirrel subwatershed. A headworks facility was constructed at the old sand creek facility.

Two lift stations operating in series transmit the flow from that location through the district's existing 14-inch force main eastward. The remaining cells at the existing complex were cleaned of biosolids and held in reserve for emergency storage in the event any issues arise within the interconnecting force main, interceptor sewer, or lift stations associated with the conveyance facilities from the district's old treatment plant site to the new facility site.

The new plant is programmed to treat all wastewater generated within the Cherokee Metropolitan District's service area, including its contract user, the SAFB. Cherokee also has an intergovernmental agreement (IGA) with the Meridian Service Metropolitan District (MSMD). MSMD can enter into an IGA with other districts to share capacity. A 16-inch diameter, 6.5-mile-long pipeline was constructed by MSMD extending from the Falcon area interconnecting to Cherokee's existing pipeline that currently services the SAFB. This main will be used to convey MSMD's and their contract user's wastewater to Cherokee. The needs of the Cherokee Metropolitan District's primary service area are projected to total 2.6 mgd together with a projected loading from Meridian Ranch and their contract users of 2.2 mgd. The capacity of the new facility will be 4.8 mgd.

The district's new WRF will discharge to a 20-inch-diameter pipeline that extends to its recharge facilities. The district has acquired a 70-acre parcel lying northeast of the intersection

of Bar 10 and Henderson Roads in eastern El Paso County. This location represents what was determined to be the optimum recharge location for constructing aquifer recharge facilities in the lower part of the basin. Ten recharge basins were constructed at that site. Each basin is equipped with automated valving to allow for alternate dosing of the basins to optimize recharge and facility performance. The district has completed the construction of the 24-inch interceptor extending from the lift station site located south of SAFB extending to the new wastewater treatment plant site. The 20-inch nonpotable line was constructed from the WWTP site to the recharge site. The recharge basins were constructed at the recharge site.

This schedule works in harmony with the district's compliance schedule contained in their current WRF's discharge permit which calls for the ultimate decommissioning of the existing facility and the construction of the new replacement facility. In 2005, the district submitted a replacement plan to the State Engineer's office for review. The subsequent questions generated by the State Engineer's office were addressed by the district with the resubmission of additional documentation on the replacement plan in March 2008. The overall approach being pursued by the district is to utilize their transbasin water, which is available for use to extinction in such a manner that they can perpetuate the underlying base water supply to their constituents.

The District is in the planning phase for construction of additional treatment processes at the WRF to address the District's inability to reduce the level of Total Dissolved Solids (TDS) into the effluent stream. The District is operating under a compliance order on consent (#MC-140514-1) to address these issues. A revision to the District's site application for the WRF is expected to be sent to the WQCD in February 2019.

21.19.2. Sunset's Ellicott Springs (formerly known as Sunset WWTP)

Over the coming 20 years, the expansion and schedule will be timed in accordance with discharge permit requirements and growth. By 2010, when the Sunset's Ellicott Springs facility comes up for discharge permit renewal, Ellicott Springs plans to construct the facilities necessary to land-apply the treated and disinfected effluent at the agronomic rate to agricultural lands, which will satisfy the ammonia standard. Currently Sunset's Ellicott Springs does not discharge as it is operating at approximately 15% of capacity. It is expected that Ellicott Town Center and Ellicott Springs Development subdivisions will gain market traction in the coming five years and will need to discharge rather than land apply. An engineering study, design work, and financing plan are currently in the works for that facility upgrade and modification.

The 15" sewer outfall line that currently serves the Ellicott School District and will eventually serve Ellicott Town Center (Viewpoint Village and Springs East Village) will be extended and become a backbone collection line for the middle part of the basin. This collection line could serve many of the proposed subdivisions in the basin's midsection.

The facility anticipates running collection lines north and northeast to collect from other developments in the basin to the north.

This facility is operating under a compliance schedule contained within its discharge permit, which requires a demonstrated plan to meet forthcoming effluent ammonia and metal limitations within the permit. Planning and ultimate implementation is to be demonstrated whereby a revised or new facility can be shown to meet the forthcoming ammonia and metal effluent limits. Depending on the proposed improvements chosen, this could cost \$1,636,000. The nature of the compliance schedule requirements suggests the facility will need to be replaced with a mechanical facility if it is to be maintained at that location.

Although Sunset's Ellicott Springs has received site application approval for 0.5 mgd, construction of the facility was temporarily delayed due to economic slowdown. The wastewater treatment facility must be constructed under CDPHE Regulation No. 84. This approach eliminated the need to obtain preliminary effluents as all discharges from the facility are to be applied in the form of irrigation water at agronomic rates. The actual wastewater treatment plant is to be constructed as a second phase. It will require the installation of a large detention facility to hold discharged water over the winter period for use as irrigation during the summer/irrigation months. Based upon the nature of the permit secured for the facility, it is not allowed to have either a surface water discharge or to permit any of its irrigation water to percolate into the underlying soil. It is the intent to convey all solids to Sunset's Ellicott Springs WWTP.

21.19.3. Falcon Highlands Metropolitan District (FHMD)

The FHMD is allocated adequate taps to fully build out their service area. Their number of 752 equivalent taps will probably take five to 10 years to fully build out. Woodmen Hills Metro District (WHMD) currently provides for the sewer service to the FHMD. WHMD operates the wastewater system in Falcon Highland and provides for treatment services.

21.19.4. High Plains Ranch (Case property)

The metro district would provide water via the Sage Water Users Association, and wastewater

service has not been resolved. A sketch plan for the property was subsequently approved in 2008.

21.19.5. Meridian Service Metropolitan District (MSMD)

Service to MSMD is currently provided by Cherokee Metropolitan District through an IGA MSMD has with Cherokee. MSMD also has 0.100 mgd capacity in the WHMDRWRF plant.

21.19.6. Paint Brush Hills Metropolitan District (PBHMD)

PBHMD provides water and wastewater, among other services, to a residential/commercial service area of approximately 1100 acres near Falcon, including the recent inclusion of the 160-acre State Land Board parcel (Red Sky Ranch). The district currently serves approximately 700 SFEs in the neighborhood of Falcon Hills plus Falcon Middle School and Grace Community Church. PBHMD's current population is approximately 3,000, including middle school attendance. Current build-out estimates for PBHMD's future residential, commercial, and school services range from 1,750 to 3,500 SFEs.

PBHMD operates its own wastewater collection system, with one lift station serving most of the service area. Wastewater treatment is provided at the Woodmen Hills Metropolitan District Regional Water Reclamation Facility. The RWRF is owned by WHMD and is located on land within the boundaries of Meridian Service Metropolitan District (MSMD).

21.19.7. Rock Springs Ranch

A PUD development plan for rural residential development was approved. A metro district was formed (Rock Springs Ranch Metropolitan District) to provide central water service. Onsite wastewater systems are proposed for the approved residential area. A preliminary plan and final plat for the first residential filing are under review, along with approvals of location for the central water tank and water treatment facility. The developer envisions urban, mixed-use development in the area in the future, at which time sewer service issues will need to be addressed.

21.19.8. Sterling Ranch

Initial development of Sterling Ranch and related developments has begun, utilizing a wastewater service arrangement with Woodmen Hills. A lift station and force main was approved.

21.19.9. Woodmen Hills Metropolitan District (WHMD)

WHMD is the largest and most developed service district in the Falcon area and has created contractual arrangements and relationships with several other newer and/or smaller districts and service areas within the Falcon area to provide a more regional basis of sewer service. They are studying options as to how and where to expand and/or develop wastewater treatment capacity. The current site is where the new RWRF is located but is in a highly developed area and requires a great deal of pumping for most sewer service.

Five-Year Plan

WHMDRWRF, online in January 2019, is designed to accommodate expansion through the installation of integrated fixed-film activated sludge (IFAS) media. The current rating is 1.3 mgd.

Twenty-Year Plan

The new facility is expected to require expansion to 3.0 mgd at a point roughly 10 to 15 years in the future. The new facility is master-planned for easy expansion expecting that ultimate area-wide capacity needs will be 3.0 mgd or greater. Growth in the service area is expected to increase between 2019 and 2022 then settling into a slower pace and slowing in roughly 2025.

22. Existing Conditions

22.1.1. Cherokee Metropolitan District

Cherokee provides wastewater service to SAFB through a lift station and associated force main to its existing WRF. SAFB's wastewater enters a 24-inch gravity interceptor sewer installed by Cherokee. The base for the first time is constructing on-site housing. Cherokee is in the process of upgrading the treatment system to include the removal of total dissolved solids (TDS).

22.1.2. Sunset's Ellicott Springs Wastewater Treatment Plant

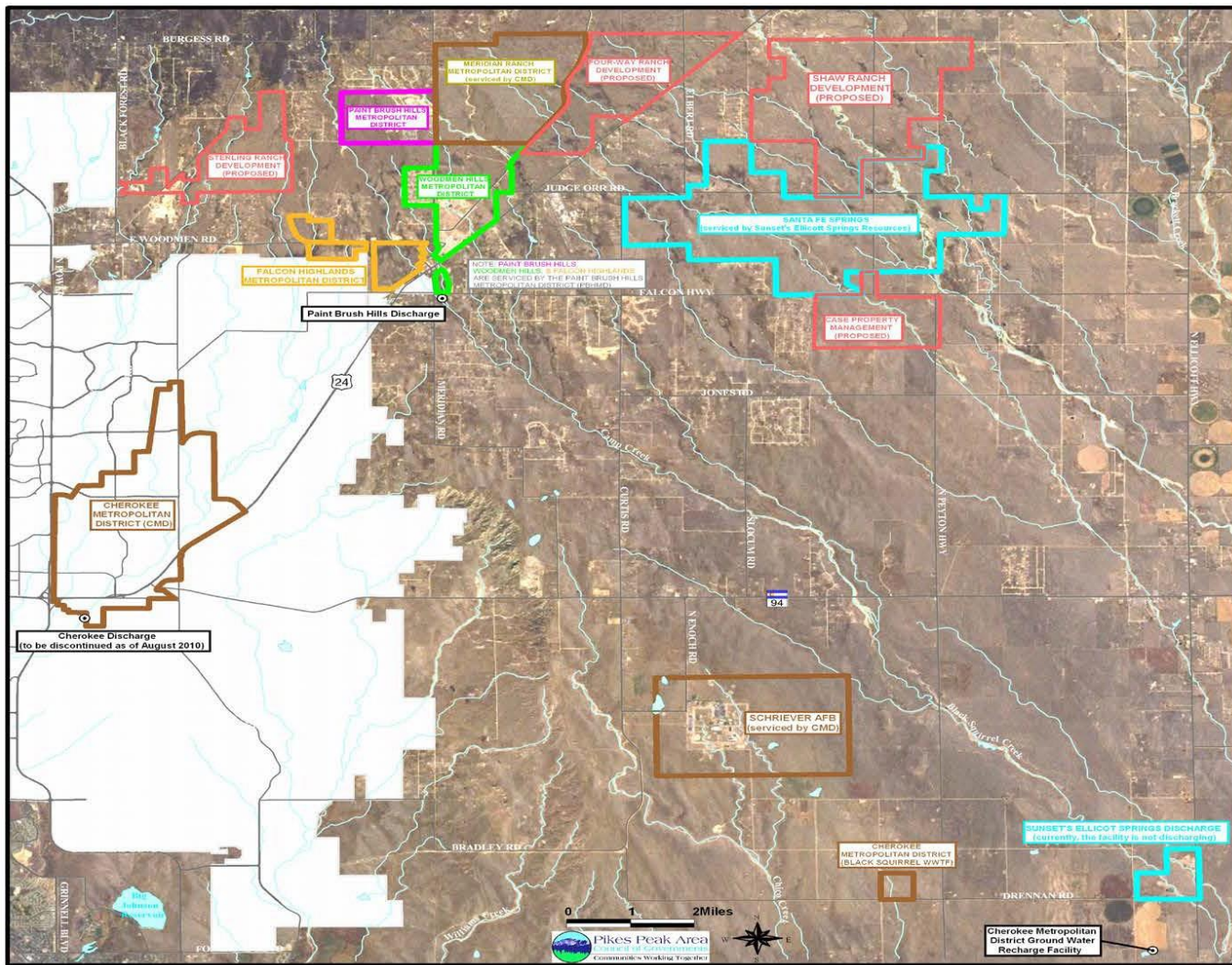
The Wastewater Treatment Plant is located approximately six miles south of Ellicott, services portions of the Upper Black Squirrel Subwatershed, which includes the Sunset Village development and Ellicott School District (connected to Ellicott Springs Resources in 2002), just north of Drennan Road. Ellicott has service commitments to serve Ellicott Springs development, Viewpoint Village and Estates and Springs East Village.

In January 2002, the Ellicott WWTP completed an upgrade to a permitted capacity of 250,000 gpd, discharging to an unnamed tributary of Black Squirrel Creek. The WWTP consists of a three-cell aerated lagoon system with chlorine disinfection.

22.1.3. Major Point Source Service Area Maps

A summary of point source data is presented in Table 9, Appendix C, which shows information obtained from the treatment facilities. Service area maps show projected service area boundaries for each facility previously described. The background of these maps is Google Earth satellite imagery, which was updated in September 2005. Major point source discharge locations are shown on the service area maps.

22.2. Figure: Chico Creek Watershed Discharge Facilities (Paint Brush Hills; Cherokee; and Sunset's Ellicott Springs)



23. Nonpoint Source Assessment

The Chico Creek Watershed covers about 736 square miles and about 37 square miles are in crop production. Most of the land owned by the state is used for livestock rangeland. The primary nonpoint source issue of concern in this region is from increasing urbanization in El Paso County.

The five biggest nonpoint source issues are:

- Livestock and grazing;
- Agriculture;
- Natural resource management; and
- Onsite Wastewater Treatment Systems.

23.1. Livestock and Grazing

Most of the livestock and grazing is currently within the Chico Creek Basin and is limited to the two main ranches, Bohart and Chico Basin. The Chico Basin Ranch is a working cattle ranch on the high prairie and is owned by the State of Colorado. It is leased by Duke and Janet Phillips and their family for a 25-year term that began November 1, 1999. Its sprawling ranges of shortgrass and sand sage prairie, spring-fed lakes, meandering creeks, and hidden pools are home to a diverse wildlife population of birds, pronghorn, deer, fish, prairie dogs, coyote, badgers, and more. The Chico Basin Ranch is dedicated to the enhancement and preservation of the natural world and western heritage. The mission of the ranch is to create a working model that views the ranch as an ecological resource base. This base supports a complementary mix of enterprises that emphasize sustainability, innovative management, and diversification as the keys to economic and ecological viability.

23.2. Agriculture

There currently appears to be limited agriculture activities, and potential sources of agriculture contamination include:

- Pesticides and fertilizer storage, mixing, loading, and inappropriate application practices;
- Back-siphoned agriculture chemicals (application of agriculture chemicals through irrigation systems is regulated by the Colorado Department of Agriculture

<https://www.colorado.gov/pacific/agconservation/groundwaterprotection> and their rules require backflow prevention be installed and inspected;

- Animal waste stockpiles or lagoons; and
- Daily barn wastes.

23.3. Natural Resource Management

Some of the problem statements identified through the Chico Basin Conservation Leadership Initiative (2002), which focused on concerns and issues in the Chico Creek Subwatershed, are:

- Growth; fragmentation; encroachment impacts to the land, ecosystems, plants and animals.
- Ecological and economic viability of basin without water.
- Proper management and mitigation.
- Economics of land development and options and opportunities to generate dollars to develop land and develop a vision and action to change economics.
- Lack of knowledge/understanding and ability to value the area.

23.4. Onsite Wastewater Treatment Systems (OWTS)

Onsite wastewater systems effluent is the most common water quality concern in rural areas that do not rely on central wastewater services. This is largely a result of OWTSs that are improperly installed or poorly maintained and may cause bacterial and chemical contamination. Groundwater contamination is especially important because of the number of groundwater wells in the area that are utilized for drinking water. Because Fountain Creek and Chico Creek Watersheds are within El Paso County, the OWTS issues associated with the Chico Creek Watershed are included in the Nonpoint Source Assessment Section of the Fountain Creek Watershed (Section 8.4).

23.5. Urban and Construction Activities

Urban and construction activities planned in the watershed, especially in the Upper Black Squirrel Creek Drainage, could have the following effects if not closely monitored:

- New development can decrease the recharge rates of the aquifers by replacing

pervious surfaces with impervious surfaces.

- Impervious surfaces can lead to increased stormwater runoff and increased velocity.
- Impacts to riparian and wetland areas.
- Pollutants such as oil and grease in stormwater runoff from urban activities.

24. Management Associations and Watershed Groups

This section discusses wastewater operating agencies, management agencies/associations, and watershed groups/organizations in the Chico Creek Watershed.

24.1. Wastewater Operating Agencies

The following organizations are recognized as wastewater operating agencies within the Chico Creek Watershed. These agencies are responsible for controlling all aspects of the collection, treatment, and discharge of sewage or industrial concern, within their company's sphere of operation. Each of these operating agencies is discussed in further detail in Section 9.3, Chico Creek Watershed Point Source Dischargers.

- 4-Way Metropolitan District
- Sunset's Ellicott Springs
- Cherokee Metropolitan District
- Falcon Highlands Metropolitan District
- Meridian Service Metropolitan District
- Woodmen Hills Metropolitan District

PPACG also recognizes wastewater operating agencies located outside of the Chico Creek Watershed but within El Paso County.

24.2. Management Agencies/Associations

No association currently exists in the Chico Creek Watershed. Due to the future growth in the Upper Black Squirrel Subwatershed, formation of the Upper Black Squirrel Water Quality Management Association (WQMA) is recommended. This association would include portions of the two previous associations, Eastern El Paso and High Plains, which were recommended for formation in the 1999 208 Plan Update. This association will be based on the boundaries of the Upper Black Squirrel Subwatershed.

Due to the limited number and size of communities outside of the watershed but still within El Paso County, it is also recommended this association review site applications from entities adjacent to the watershed, including the towns of Calhan and Ramah and the Colorado Centre Metropolitan District. Until a WQMA is formed, this area will continue to have all its site applications for new or modified wastewater facilities or interceptors reviewed by the Lower Fountain WQMA before being submitted to PPACG.

24.2.1. Cherry Creek Watershed Authority

The Cherry Creek Watershed Authority was formed to determine appropriate phosphorous loading into the Cherry Creek Reservoir. Phosphorus loading in Cherry Creek Reservoir is a prime concern for many agencies. Planning activities relating to the reduction of phosphorus loading in the reservoir have occurred through the local master-planning group (Cherry Creek Basin Water Quality Authority) and the CDPHE. Following rigorous work to provide an equitable plan to allocate phosphorus loading in the entire Cherry Creek basin, the Colorado Water Quality Control Commission adopted “the Cherry Creek Reservoir Control Regulation, Regulation #72”. Although El Paso County is located in a small portion of the Cherry Creek basin, due to the lack of urban density developments and a nondischarging wastewater treatment plant facility, this regulation does not contain a phosphorous allocation for El Paso County.

24.2.2. El Paso County

El Paso County is a statutory government and has its own individual environmental health department and processes septic system permits, regulating water quality, solid waste and other environmental health concerns. The county must assure adequate water supplies are available to support approved development and in approving the plans for Title 32 Special Districts and land use approvals for related facilities.

24.3. Groups/Organizations

24.3.1. Upper Black Squirrel Creek Groundwater Management District

This district was established in 1968 by the Colorado Groundwater Commission to review water rights applications and information concerning withdrawals for this basin. This district is authorized to adopt additional rules and regulations to help administer groundwater within their district. The boundaries of this district generally correspond to the natural limits of the surface water drainage basin down to the southerly extent of Squirrel Creek Road. Chico Basin Conservation Leadership Initiative. A Chico Creek Watershed group met several times in 2002 to talk about concerns and issues in the Chico Creek Subwatershed. This group is no longer meeting. It was composed of representatives from the El Paso County Planning and Community Development Department, Natural Resource Conservation Service, the Nature Conservancy, Chico Basin Ranch, and Central Colorado Conservation District.

25. Conclusions and Recommendations

25.1. Conclusions

The Chico Creek Watershed is unique because portions of the watershed are still relatively undisturbed, but, because of its proximity to Colorado Springs and other metropolitan areas, this is expected to change. Most of the growth projected in this watershed is located in the northern portion.

Conclusions drawn from a review of the information contained in the plan include:

- Chico Creek Subwatershed is primarily rural, but several developments are proposed in the northern portion of the Upper Black Squirrel Subwatershed. This development is expected to increase wastewater needs.
- The primary source of drinking water is from groundwater wells that tap into the Upper Black Squirrel Creek alluvial aquifer.
- The Chico Creek Subwatershed is a large, biologically diverse area with large tracts of state school trust and federal-owned land. The subwatershed historically sustained an agricultural economy but is now threatened by fragmentation, development, and loss of water due to increased diversions and growth-related uses.

25.2. Recommendations

Continue the El Paso County Groundwater contamination study (2009). Assess and evaluate recommendations made through that study for implementation.

Evaluate the need and the funding possibilities of locating a water quality and streamflow monitoring station on Chico Creek (immediately above the confluence with the Arkansas River) and/or Black Squirrel Creek. The upper and middle portions of Black Squirrel Creek and Chico Creek are ephemeral streams; there is perennial flow only along the lower portions of Black Squirrel Creek and Chico Creek.

25.2.1. Source Water Protection

Evaluate possible locations and needs for a well-head protection program in the Upper Black Squirrel Subwatershed. Recommendations and information collected through the CDPHE

Source Water Assessment Protection effort should be used in this evaluation. This will become a critical issue to address with the increased growth and reliance on the alluvial aquifer as a source of domestic water supply.

25.2.2. Stormwater and Urban Runoff

Stormwater detention, retention ponds, or other BMPs should be utilized to minimize flooding, maximize infiltration, and minimize water quality impacts from impervious surface contaminants. Detention ponds should also be designed as an amenity for development projects and other purposes.

25.2.3. Watershed Plan

Evaluate the need to develop a watershed plan for the Chico Creek Watershed based on the EPA's nine watershed planning elements.

25.2.4. Onsite Wastewater Treatment Systems (OWTS)

The possibility of increased nutrient loading into surface water or groundwater should be assessed, especially in critical areas where poor soils and high-water tables contribute to septic system failure. This analysis will help evaluate if residential and commercial property should be connected to a central wastewater service.

A map should be prepared that indicates areas where OWTS should not be located. The map should show the following components:

- Location of OWTSs and monitoring and drinking-water wells within El Paso County;
- Location of failed OWTS;
- Facts influencing the design and location of OWTS.

Similar recommendations are also made for Park and Teller Counties.

25.2.5. Wastewater Treatment Plants

Evaluate the possibility of future wastewater treatment plants and expansion of existing wastewater treatment plants in areas of existing and projected growth and proximity to areas currently served by OWTSs.

25.2.6. Water Quality Management Association

An Upper Black Squirrel WQMA should be formed to serve the Upper Black Squirrel Subwatershed, based on the boundaries of the Upper Black Squirrel Subwatershed. This is critical because of the significant current growth and planned future growth in this watershed and the effects this will have on current and future wastewater services provided in the area. The Upper Black Squirrel WQMA would have authority to review all site applications for new or modified wastewater facilities or interceptors. Currently, these are being reviewed by the Lower Fountain or Upper Monument WQMA. The WQMA should be established with the cooperation of the Lower and Upper Monument WQMA, and the initial members should consist of:

- 4-Way Metropolitan District
- Sunset's Ellicott Springs
- Paint Brush Hills Metropolitan District
- Cherokee Metropolitan District (Due to service area boundaries and legal ties, Cherokee is also a member of the Lower Fountain WQMA.)
- Ellicott School District
- Falcon Highlands Metropolitan District
- Meridian Service Metropolitan District
- Woodmen Hills Metropolitan District (Currently a member of the Lower Fountain WQMA but will change when Upper Black Squirrel WQMA is formed.)
- El Paso County Board of Commissioners

Future proposed districts or developments impacting the watershed should also be reviewed to for inclusion on this list. Once this WQMA is established, it will also be responsible for review and coordination of permits affecting areas immediately outside the watershed such as the towns of Calhan and Ramah.

Until a WQMA is established, the Lower Fountain WQMA will be responsible to review any site applications in this area.

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27. Appendix A

27.1. Site Application Review Process

PPACG staff and the Water Quality Management Committee (WQMC) review site applications and recommend acceptance or rejection to the PPACG Board of Directors, which is responsible for signing the site application. This review helps the Colorado Department of Public Health, Water Quality Control Division (CDPHE-WQCD) determine if they should approve or deny a site application and potential requirements of the applicant. PPACG and the CDPHE require site applications be consistent with the latest revision of the Water Quality Management (208) Plan. In some cases, the applicant may request to revise the 208 Plan prior to submitting the site application. All 208 Plan amendments will be reviewed separately and processed according to Appendix B, *Water Quality Management Plan Amendment Procedure*.

A site application is required for the following reasons:

- Construction of a new domestic wastewater treatment plant; or
- Construction or expansion of a lift station or interceptor; or
- Modification/expansion of an existing wastewater treatment plant; or
- Request to amend a previous site approval (lift station, interceptor, or wastewater treatment plant).

Each of the four site application tracts has a different set of criteria that must be addressed and require certain signatures before it is submitted to the CDPHE- WQCD. In the table below, each of the four site application tracts are shown along with the signatures required.

For each of the four different tracks, a site application checklist and site application form is available through PPACG. The requirements, stated in WQCC Regulation 22, can be downloaded from <https://www.colorado.gov/pacific/cdphe/water-quality-control-commission-regulations>.

27.2. Table: Site Application Review Signatories

Signatures	New WWTP	Construction or expansion of lift station or interceptor	Mod./exp. to existing WWTP	Amendment to previous site approval ³
Water Quality Management Agency ¹	YES	YES (review only) ⁴	YES	Yes (review and comment only)
Water Quality Planning Agency	YES	YES	YES	Yes (review and comment only)
City or Town ¹	YES	YES	YES	Yes (review and comment only)
County ²	YES	YES	YES	Yes (review and comment only)
Local Health Authority	YES		YES	Yes (review and comment only)

¹If located within the jurisdictional boundary of city or town (contact planning department), signature is required.

²If located within the boundaries of the city or town, county signature is not required, but if it is located outside of jurisdictional boundaries of city or town in the unincorporated portion of county, then a county signature is required.

³Copies of site application must be provided as well as the date on which the site application was transmitted to each entity. These entities shall be allowed 15 working days from receipt of the request to comment directly to the WQCD. PPACG will forward the site application to members of the SARC and chairman of the designated management agency. Amendments to a previous site approval include re-rating of plant capacity, lift stations and interceptors.

⁴Must be reviewed by management agency prior to being submitted to PPACG, but signature not required.

After the local review process is complete and all the required signatures are obtained, the site application is sent to the CDPHE-WQCD. The local and CDPHE-WQCD review processes usually take about six months each.

27.3. Site Application Review Process

Provided below is a summary of the process required before the PPACG Board of Directors review and either approve or disapprove the site application. The headings below correspond to the signatories shown in Table 27.2.

Prior to submitting a site application, please contact the Pikes Peak Area Council of Governments (719) 471-7080 to determine if the location of the proposed site application is within the boundaries of an existing or proposed Water Quality Management Agency (WQMA). The WQMA

will review the site application and, if required, sign-off on the site application (for new wastewater treatment plants and modifications/expansion to existing plants) prior to submission to PPACG for review by the Site Application Review Committee (SARC).

27.3.1. Water Quality Management Agency

There are four water quality management agencies:

- *Upper Monument Water Quality Management Association* – covers the northern portion of the Monument basin.
- *Mid Monument Water Quality Management Association* – primarily covers the City of Colorado Springs and includes the City of Colorado Springs, Garden Valley Water and Sanitation District, and the City of Manitou Springs.
- *Lower Fountain Water Quality Management Association* – covers lower Fountain (not including Pueblo County) and includes Fort Carson, Fountain, Security, Widefield and Cherokee Sanitation District.
- *Teller County Water Quality Management Association* – covers Teller County

27.3.2. Water Quality Planning Agency (PPACG)

PPACG Review Process

Approximately 45 days is required for an applicant to complete the PPACG review process. To get on the agenda, please contact the PPACG Environmental Planner at (719) 471-7080 x116. There are three steps involved in the PPACG review process.

1. **Site Application Review Committee (SARC)** meetings are arranged after a site application is submitted. At least two weeks lead-time is necessary to allow for time to set up the meeting and to give members enough time to review the application. It is the responsibility of the applicant to send copies of the complete site application package to all members of the SARC. The SARC conducts a thorough review of the site application to ensure it addresses all the regulatory requirements in CDPHE Regulation 22. The applicant can bring someone to the

meeting to address all technical questions members have.

2. The **Water Quality Management Committee (WQMC)** meets on the first Tuesday of every month at 10:00 a.m. and reviews the comments made by the SARC and responses from the applicant. The applicant is required to have all responses and comments made by the SARC to the Environmental Planner by the third Monday of every month so these comments can be included in the packet of information distributed to the WQMC members for review. The WQMC makes a recommendation to the PPACG Board of Directors regarding their approval or disapproval of the site application.
3. The **PPACG Board of Directors** meets on the second Wednesday of every month at 9:00 a.m. and the Chairman has the approval to sign the application on behalf of the Water Quality Planning Agency. An original copy of the site application must be provided to the PPACG Environmental Planner prior to this meeting for signature. This item is usually placed on the consent calendar, and someone should be available to answer any questions from Board members.

27.3.3. City or Town (if site is inside boundary)

If the location of the proposed facility is within the jurisdictional boundaries of a city or town, facility approval will require the review and signature from someone on behalf of that entity. This is usually someone from the Planning Department but can be different for each entity. Please contact the PPACG Environmental Planner at 471-7080 x119 if you are uncertain who should sign the site application.

27.3.4. County (if site is outside municipal boundary)

Descriptions and contact information for each of the three counties is shown below:

- El Paso County Planning: El Paso County Planning has a 45-day lead requirement to get applications placed on their agenda. The El Paso County Planning Department meets on the third Tuesday of the month at 9:00 am, and the El Paso County Commissioners meet the second and fourth Thursday at 9:00 am. El Paso County Planning requires the signature of the Water Quality Management Planning

Agency (PPACG) before submitting the application to them.

- Teller County Planning: Teller County Planning Commission meets on the second Tuesday of the month at 7:00 p.m. in the Woodland Park City Council Chambers. Please call the Teller County Planning Department at (719) 687-5260 for more information.
- Park County Planning: Please call the Park County Planning Department at (719) 836-4279 for more information.

27.3.5. Local Health Authority

Applications for construction of a new domestic wastewater treatment plant require the signature of the Health Department for the respective area. The telephone numbers for each of the three local health authorities are listed below.

- Teller County Environmental Health Department: 719.687.6416
- Park County Health Authority: 719.836.4267
- El Paso County Health Authority: 719.578.3199

28. Appendix B

28.1. PPACG Water Quality Management Plan Amendment Process

The 208 Plan details the regional considerations for protection of water quality. In so doing, it projects growth and development trends in the area and establishes a rational plan for accommodating growth. A plan objective is to avoid unacceptable adverse environmental impacts which might be caused by allowing wastewater services to be provided through numerous entities for facilities in an uncoordinated fashion. The Regional Plan amendment process is designed to maintain flexibility in the plan so that unanticipated events can be accommodated when it is shown to be in the best interests of the region. These events include site approvals for new facilities and service area boundary changes. For site approvals, the Site Approval Application Review Process must be pursued in conjunction with the plan amendment process.

When new domestic wastewater treatment works (i.e. treatment facilities, lift stations, or interceptors) are proposed which are not identified in the Regional Plan or when expansions or modifications of existing facilities are proposed which would allow them to serve a greater population than specified by the Regional Plan, State regulations indicate the Regional Plan should be amended to incorporate the proposed facility changes before Site Approval can be granted. Amendment of the Regional Plan adds time to the site approval process, but the added time can be minimized by expeditious pursuit of a plan amendment as soon as possible prior to submission of the site approval application.

Also, any significant modification of the service area boundaries of an existing Operations Agency or any formation of a new Operations Agency requires an amendment of the Regional Plan. A new agency must be listed as a designated Operations Agency, and the service area boundaries must be consistent with what is delineated in the Regional Plan in order for review and approval of siting of new wastewater collection and treatment facilities according to State Regulations.

The following Regional Plan amendment process details the criteria for determining whether a given project would require no amendment, a minor amendment, or a major amendment, and it presents the amendment procedure. An applicant should be aware of this procedure and the supplemental information and processing time it requires.

1. Determination of Amendment Requirement

- i. PPACG Staff and the WQMC will review the information and make a

recommendation to the PPACG Board if an amendment is necessary.

- ii. The PPACG Board has the final responsibility of determining the plan amendment requirements.

2. Basis for Determination

- i. No plan amendment is necessary if the proposed project is in conformance with the Regional Plan.
 - ii. A plan amendment will not normally be required when:
- 3. The project proposes changes in treatment process for improving water quality that do not increase the capacity of the treatment plant.
 - 4. The project is a pumping station to serve an area within the approved service area of the applying Operations Agency, with the population to be served already included in the Regional Plan projections.
 - 5. The project proposes a minor adjustment in service area boundaries involving less than 10 acres.
 - i. A minor amendment will normally be deemed necessary if the proposed project involves providing sewage service which meets one of the following:
 - 6. The amount of sewage generated and served through a treatment facility, pump station, or interceptor is outside of the service area and is less than 50,000 gpd (population equivalent of 667 people based on 75 gpcd).
 - 7. The addition of more than 10 but less than 160 acres to a service area.
 - 8. The addition of an area to a defined service area that does not cause an increase of projected population greater than 667 people.
 - i. Minor amendments are changes for which water quality impacts or major conflicts are not anticipated and must be agreed upon by the Management Agency, PPACG, and the State Water Quality Control Division.
 - ii. An amendment will be considered major if it involves a proposal to serve a new area, development of a new wastewater treatment plant or

provide increased capacity more than that stated above for a minor amendment. These major amendments warrant the highest level of attention and priority as stated in Policy 98-2 adopted by the State Water Quality Control Commission.

9. Amendment Procedure

- i. Upon initial submittal of a 208 Plan amendment to the PPACG for review, a determination of whether the application is complete will be made, generally within 15 days of submittal. Applications deemed incomplete will be returned to the applicant.
- ii. Once an application is found to be complete, the decision on whether a plan amendment is necessary and whether it is major or minor is made. If an amendment is required, it will be drafted by PPACG within 30 days.
- iii. During the next 30 days, the draft amendment is circulated by PPACG to the project sponsor, applicant Management Agency, local jurisdiction planning and health departments, other potentially affected management and operations agencies; and comments are requested.
- iv. For a minor amendment the PPACG decides whether to approve it within 30 days of submittal.
- v. For a major amendment, the PPACG schedules a public hearing at its next meeting and decides whether to approve the proposal.
- vi. Approved plan amendments will be submitted to the Water Quality Control Division (WQCD) for their concurrence.

10. Project Information Necessary for Amendment

The following list of information must be submitted for a project (where applicable) to allow determination of whether a plan amendment is necessary and to permit preparation and processing of the amendment. Most of this required information is also necessary to process a site approval application. (See list included in Site Approval Process.)

- i. Location of the proposed facility, geographical area it is intended to serve by specific delineation of projected service area boundaries on a

map, and the existing population of the proposed service area and the 10 and 20-year population projections.

- ii. Design hydraulic and organic loading capacity of the proposed facility and the expected initial flows and loadings and the projected flows and loading in 10 and 20 years.
- iii. The names of existing sewer service entities within 5 miles of the proposed service area and facility, a map indicating their boundaries, and direction of gravity flow from the proposed area.
- iv. Estimated construction costs for the proposed facility, and an estimate of the cost differential between building the proposed facility and the least costly alternative for connecting to an existing facility including a map indicating construction required to accomplish any such connection.
- v. A letter from all existing sanitation districts or other sewer service entities within 5 miles stating the feasibility of providing service to the service area and the justification for not connecting to an existing facility where feasible.
- vi. Identification of other permittees discharging to the same receiving waterbody and downstream discharges on main streams and any effect the proposed discharge would have on any of them.
- vii. Proximity to the nearest domestic drinking water source or diversion down gradient from the discharge.
- viii. Proposed permit effluent limits as developed by the Water Quality Control Division of the State Department of Health for any discharge.
- ix. Analysis of treatment alternatives considered and a detailed justification for choosing the proposed alternative in terms of surface and/or groundwater quality and other environmental impacts and economic and institutional considerations.
- x. Institutional arrangements such as contract and/or covenant terms for

all users. This must include Articles of Incorporation and By-laws for homeowner's groups to include powers and authority to ensure proper operation and maintenance of the facility for its projected life.

- xi. Management capabilities for controlling the wastewater throughout and maintaining treatment within the capacity limitations of the facility on a continuous long-term basis. This would include user contracts, operating agreements, pretreatment requirements, etc.
- xii. Potential for water reuse including water rights limitation and any water augmentation plan.
- xiii. Present population and flow commitments of existing facilities to which the development will connect.
- xiv. An indication as to how this project relates to existing and envisioned facilities and the needs of a regional service area for the entire drainage basin.
- xv. For service area additions, a map delineating the additional area requested and a report explaining the reasons this area would be best served by the entity requesting the expansion of their service area.

28.2. Table: PPACG Approve Site Applications 2010 – August 2019

Project Name	Approved Date	Type	County
Wakonda Hills Sewage Lift Stations	2/23/10	Lift Station	El Paso
Fort Carson Wastewater Treatment Plant Lift Station	4/26/11	Lift Station	El Paso
Florissant Fossil Beds National Monument Septic System	5/24/2011	Septic System	Teller
Security Sanitation District Waterview Lift Station	4/30/2013	Lift Station	El Paso
Waterview Lift Station Site Application	10/29/2013	Lift Station	El Paso

64-Way Ranch Lift Station Site Application	10/29/2013	Lift Station	El Paso
YMCA Camp Santa Maria WWTF Improvement	9/26/2016	WWTF Improvement	Park
Academy Water & Sanitation District proposed lift station	10/26/2016	Lift Station	El Paso
Fort Carson SOF Lift Station	2/28/2017	Lift Station	El Paso
Eleven Mile State Park Water Treatment Facility - Relocation of System Absorption Fields	05/29/2018	Amendment to existing site application	Park
Upper Monument Water Quality Management Association - Wagons West Lift station/Force Main	05/29/2018	Lift Station	El Paso
Security Sanitation District Wastewater Treatment Facility Improvements	5/29/2018	Security Sanitation Waste Water Treatment Facility update	El Paso
Benet Hill Onsite Waste Treatment System	10/15/2018	WWTF	El Paso
River Bend Creek Lift Station	2/5/19	Lift Station	El Paso
Fountain South WWTF	05/7/2019	WWTF	El Paso
Falcon Meadow RV Campground	06/04/2019	Lift Station	El Paso
Black Squirrel Creek Lift Station No. 2 Design Update	06/04/2019	Lift Station	El Paso
Lone Rock Conference and Retreat Facility Lift Station	8/6/19	Lift Station	Park
Rock Creek Metro District Lift Station	8/6/19	Lift Station	El Paso

28.3. Public Comment Period

Pikes Peak Area Council of Governments posted the 2019 208 Plan for public comment on CDPHE's website beginning June 27, 2020 to July 27, 2020. To encourage comments, PPACG posted the link to CDPHE's webpage on social media, as well as sharing it with community members and interest groups. Because of the 2020 pandemic, PPACG was unable to host public meetings.

No comments were received during this time. No changes were made to the 208 Plan after the public comment period was over.

29. Appendix C:

29.1. Table 2: Water Quality Standards for Stream Segments for Stream Segments in the Park and Teller Counties Portions of South Platte/ Upper South Platte Watersheds

	Stream Segment Description	Desig	Classifications	Physical & Biological	Inorganic (mg/l)		Metals (ug/l)		
2c	South Mosquito Creek from the source to confluence with Mosquito Creek and No Name	UP	Aq Life Cold 1 Recreation E Water Supply Agriculture	T=TVS(CS-I) C D.O.= 6.0 mg/l D.O.(sp)=7.0 mg/l pH = 6.5 - 9.0 E.Coli=126/100 ml	NH3(ac/ch)=TVS Cl2(ac)=0.019 Cl2(ch)=0.011 CN=0.005	S=0.002 B=0.75 N02=0.05 N03=10 Cl=250 S04=WS	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot)	Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ch)=TVS
3	All tributaries to the South Platte River, including all lakes, reservoirs and wetlands from a point immediately below the confluence with Tarryall Creek to a point immediately above the confluence with the North Fork of the South Plane River, except for specific listings in Segment 1 b.		Aq Life Cold 1 Recreation E Water Supply Agriculture	T=TVS(CS-I) C D.O.= 6.0 mg/l D.O.(sp)=7.0 mg/l pH = 6.5 - 9.0 E.Coli=126/100 ml	NH3(ac/ch)=TVS Cl2(ac)=0.019 Cl2(ch)=0.011 CN=0.005	S=0.002 B=0.75 N02=0.05 N03=10 Cl=250 S04=WS	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot)	Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS
4	Mainstem of the North Fork of the South Platte River, including all tributaries, lakes, reservoirs and wetlands from the source to the confluence with the South Platte River, except for specific listings in Segments 1b, 5a, 5b, and 5c.		Aq Life Cold 1 Recreation E Water Supply Agriculture	T=TVS(CS-I) C D.O.= 6.0 mg/l D.O.(sp)=7.0 mg/l pH = 6.5 - 9.0 E.Coli=126/100 ml	NH3(ac/ch)=TVS Cl2(ac)=0.019 Cl2(ch)=0.011 CN=0.005	S=0.002 B=0.75 N02=0.05 N03=10 Cl=250 S04=WS	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot)	Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS
5a.	Mainstem of Geneva Creek from the source to the confluence with Scott Gomer Creek.		Aq Life Cold 1 Recreation E Agriculture	T=TVS(CS-I) C D.O.= 6.0 mg/l D.O.(sp)=7.0 mg/l pH = 3.5 - 9.0 E.Coli=126/100 ml	NH3(ac/ch)=TVS Cl2(ac)=0.019 Cl2(ch)=0.011 CN=0.005	S=0.002 N02=0.05	As(ac)=340 As(ch)=7.6 (Trec) Cd(ch)=2 CrIII(ch)=100 CrVI(ac/ch)=25 Cu(ch)=18(dis)	Fe(ch)=1200 Pb(ch)=4 Mn(ch)=530(dis) Hg(ch)=0.05 Ni(ch)=50	Se(ch)=4.6 Ag(ch)=1 Zn(ch)=1909(dis)
	Stream Segment Description	Desig	Classifications	Physical & Biological	Inorganic (mg/l)		Metals (ug/l)		
5b.	Mainstem of Geneva Creek from the confluence with Scott Gomer Creek to the confluence with the North Fork of the South Platte River; all tributaries of Geneva Creek including lakes, reservoirs, and wetlands from source to confluence with the North Fork of the South Platte River.		Aq Life Cold 1 Recreation E Water Supply Agriculture	T=TVS(CS-I) C D.O.= 6.0 mg/l D.O.(sp)=7.0 mg/l pH = 6.5 - 9.0 E.Coli=126/100 ml	NH3(ac/ch)=TVS Cl2(ac)=0.019 Cl2(ch)=0.011	CN=0.0055=0.002 B=0.75 N02=0.05 N03=10 Cl=250 S04=WS	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000(Trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis) Hg(ch)=0.01(Tot) Ni(ac/ch)=TVS	Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS

29.2. Table 3: Approved TMDLs in the South Platte/ Upper South Platte Watersheds

Segment #	Affected Portion	Pollutant	Water Quality Targets	Recommended Actions	Date
COSPBO04a	Mainstem of South Boulder Creek	Cadmium, Zinc	Attainment of aquatic life use classification standards for Cd.	- Remediation plan for Gamble Gulch - Additional monitoring	2010
COSPUS05a COSPUS05b	Mainstem of Geneva Creek	Cadmium, Copper, Zinc, Manganese	Attainment of site-specific chronic cadmium, copper, manganese, and zinc standards; Attainment of acute and chronic table value standards for cadmium.		2010
COSPBO02b	Mainstem of Boulder Creek, 447 square miles	<i>E.coli</i>	Attainment of two month geometric mean of <i>E.coli</i> water quality standard (126 cfu/100 mL) throughout segment.	Collaboration between local jurisdictions	2011
COSPUS15	Mainstem of South Platte River	Cadmium	Attainment of the assigned aquatic life use designation.		2011
COSPM04	Barr Lake and Milton Reservoir	Dissolved oxygen, Phosphorus	Attainment of assigned use classification standards for DO. Attainment of aquatic life, recreation and water supply use classification standards for Ph.		2013
COSPSV04a COSPSV04b COSPSV04c	Mainstem Left Hand Creek, James Creek, Little James Creek	Cadmium, Copper, Zinc, pH, Lead	Attainment of the table value based standards for dissolved Cd, Cu, Pb, Zn and pH.	Additional monitoring	2015
COSPSU15	Upper South Platte Segment 15	<i>E.coli</i>	Attainment of recreation use.	Interested stakeholders to develop a coordinated implementation plan, including education and outreach; coordination with other watershed groups; additional monitor; possible future microbial source tracking	2015

				for source identification; possible future remission of the TMDL.	
COSPBD01	Mainstem of Big Dry Creek, approximately 108 square miles	<i>E.coli</i>	Attainment of <i>E.coli</i> water quality standard (205 cfu/100 mL) throughout segment.	• Coordinate efforts of the Big Dry Creek Water Association • Additional monitoring • Infrastructure maintenance and upgrades • Education and outreach • Stormwater BMPs	2016

29.3. Table 4: South Platte and Upper South Platte Discharge NPDES Permit Information

	Upper South Platte Segment COSPUS01a		USP Segment COSPUS02a	Upper South Platte Segment COSPUS04		
	Town of Alma	Fairplay Sanitation District	Florissant Water & Sanitation District	City of Woodland Park	Will-O-Wisp	Bailey Water & Sanitation District
NPDES Permit #	CO-0035769	CO-0040088	CO-0041416	CO-0043214	CO-0041521	COG-588056
Permit Expiration Date	5/30/2010	Not Issued	6/30/2010	5/31/2014	8/31/2009	6/31/2010
Flow (MGD)	0.117	0.300	0.057	0.893	0.060	0.075
Existing Load (MGD)	0.041	0.10	0.019	0.69	0.025	0.03
Year at 80% Design	2020	2020	2025	2015	2025	2025
Year at 95% Design	2025	2025	2030	2021	2030	2030
Organic (lbs/day BOD ₅)	111	880	162	1,955	138	125
Existing Load (lbs/day BOD ₅)	73	200		1,740	Not Available	29
Year at 80% Design	2020	2020	2020	2010	Not Available	2025
Year at 95% Design	2025	2025	2025	2013	Not Available	2030
30-day avg / 7-day avg						
BOD	30 / 45	30 / 45	30 / 45	30 / 45	30 / 45	30 / 45
Total Suspended Solids	75 / 110	75 / 110	75 / 110	30 / 45	30 / 45	30 / 45
Fecal Coliforms, #/100 ml	4,140 / 8,280	5,339 / 10,678	NA	NA	200 / 400	6,000 / 12,000
E. coli	NA	2,000 / 4,000	1,248 / 2,496	126 / 252	NA	NA
Total Residual Chlorine, mg/l ¹	N/A / 0.083	0.298 / NA	Report / 0.05	N/A / 0.019	0.0042 / 0.0054	Report / 0.5
Total ammonia as N, mg/l, 30-day avg / daily max						
January	26.8 / Report	17 / Report	10.3 / Report ¹	5.3 / NA	2.7 / Report	25 / 25
February	Report / Report	18 / Report	11.5 / Report	5.3 / NA	1.8 / Report	25 / 25
March	Report / Report	13 / Report	9.1 / Report	5.3 / NA	3.4 / Report	25 / 25
April	Report / Report	19 / Report	6.6 / Report	5.3 / NA	2.7 / Report	25 / 25
May	18.1 / Report	24 / Report	6.5 / Report	8.2 / NA	1.8 / Report	25 / 25
June	Report / Report	Report / Report	16.3 / Report	8.2 / NA	3.4 / Report	25 / 25
July	Report / Report	19 / Report	7.6 / Report	8.2 / NA	7.7 / Report	25 / 25
Aug	Report / Report	20 / Report	6.0 / report	5.9 / NA	2.7 / Report	25 / 25
Sept	Report / Report	16 / Report	4.9 / Report	5.9 / NA	2.0 / Report	25 / 25
October	Report / Report	26 / Report		5.9 / NA	7.7 / Report	25 / 25
November	Report / Report	24 / Report	13.5 / Report	5.3 / NA	3.1 / Report	25 / 25
December	Report / Report	18 / Report	3.3 / Report	5.3 / NA	3.8 / Report	25 / 25
Metals (conc in ug/l, 30-day avg / daily max)						
Chromium III Dissolved	555.7 / 72.3	NA	NA	NA	NA	NA
Copper, PD	13.1 / 8.7	NA	NA	NA	NA	NA
Nickel, PD	456.3 / 50.7	NA	NA	NA	NA	NA
Zinc, PD	114.2 / 115.1	NA	NA	NA	NA	NA
Silver, PD	1.93 / 0.07	NA	NA	NA	NA	NA
Cadmium, PD	3.58 / 2.19	NA	NA	NA	NA	NA
Manganese, PD	2956 / 1633	NA	NA	NA	NA	NA

Footnotes¹ Ammonia limits will apply once construction is completed (Report only during construction)

29.4. Table 5: Upper Arkansas Stream Classifications and Water Quality Standards

	Stream Segment Description	Desig	Classifications	Physical & Biological	Inorganic (mg/l)			Metals (ug/l)		
18	Mainstem of Currant Creek (Park County), including all tributaries, wetlands, lakes, and reservoirs, from the source to the confluence with Tallahassee Creek, except for the specific listings in 17a, 17b, and 17c.		Aq Life Cold 1 Recreation E Water Supply Agriculture	D.O. = 6.0 mg/l D.O.(sp)= 7.0 mg/l pH = 6.5-9.0 E.Coli= 126/100ml	NH3(ac/ch)=TV S CL2(ac)=0.019 CL2(ch)=0.011 CN=0.005 S=0.002	B= 0.75 NO2= 0.05 NO3= 10 Cl= 250 SO4= WS	As(ac)=340 As(ch)=0.02 (Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000 (trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis)	Hg(ch)=0.01 (tot) Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	
19	Mainstem of Fourmile Creek, including all tributaries, wetlands, lakes, and reservoirs, from the source immediately above the confluence with Cripple Creek.		Aq Life Cold 1 Recreation E Water Supply Agriculture	D.O. = 6.0 mg/l D.O.(sp)= 7.0 mg/l pH = 6.5-9.0 E.Coli= 126/100m l	NH3(ac/ch)=TV S CL2(ac)=0.019 CL2(ch)=0.011 CN=0.005 S=0.002	B= 0.75 NO2= 0.5 NO3= 10 Cl= 250 SO4= WS	As(ac)=340 As(ch)=0.02 (Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000 (trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS	Hg(ch)=0.01 (tot) Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	
20	Mainstem of Fourmile Creek, including all tributaries, wetlands, lakes, and reservoirs, from immediately above the confluence with Cripple Creek to the confluence with the Arkansas River, except for the specific listing to segment 23.		Aq Life Cold 1 Recreation E Water Supply Agriculture	D.O. = 6.0 mg/l D.O.(sp)= 7.0 mg/l pH = 6.5-9.0 E.Coli= 126/100ml	NH3(ac/ch)=TV S CL2(ac)=0.019 CL2(ch)=0.011	CN=0.005 S=0.002 B= 0.75 NO2= 0.05 SO4= WS	As(ac)=340 As(ch)=0.02 (Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=100(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000 (trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis)*	Hg(ch)=0.01 (tot) Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS	
21 a	Mainstem of Cripple Creek from the source to a point 1.5 miles upstream of the confluence with Fourmile Creek.		Aq Life Cold 2 Recreation E Agriculture	D.O. = 6.0 mg/l D.O.(sp)= 7.0 mg/l pH = 6.5-9.0 E.Coli= 126/100m l	NH3(ac)=TVS(s a) NH3(ch)=TVS(e la) CL2(ac)=0.019 CL2(ch)=0.011	CN=0.005 S=0.002 B= 0.75 NO2= 0.05	As(ac)=340 As(ch)=100 (Trec) Cd(ac)=TVS Cd(ch)=TVS CrIII(ac)=100(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=1000 (trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Hg(ch)=0.01(tot) Ni(ac/ch)=TVS	Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS	

21 b	Mainstem of Cripple Creek from a point 1.5 miles upstream to the confluence with Fourmile Creek		Aq Life Cold 2 Recreation E Agriculture	D.O. = 6.0 mg/l D.O.(sp)= 7.0 mg/l pH = 6.5-9.0 E.Coli= 126/100m l	NH3(ac)=TVS(sa) NH3(ch)=TVS(ela) CL2(ac)=0.019 CL2(ch)=0.011	CN=0.005 S=0.002 B= 0.75 NO2= 0.05	As(ac)=340 As(ch)=100 (Trec) Cd(ac/ch)=TVS CrIII(ch)=100(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=1000 (trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Hg(ch)=0.01(tot) Ni(ac/ch)=TVS	Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS
22 a	Mainstem of Arequa Gulch from the source to the confluence with Cripple Creek	UP	Aq Life Cold 2 Recreation N Agriculture	D.O. = 6.0 mg/l D.O.(sp)= 7.0 mg/l pH = 6.0-9.0 E.Coli= 630/100ml	NH3(ac/ch)=TVS CL2(ac)=0.019 CL2(ch)=0.011	CN=0.005 S=0.002 B= 0.75 NO2= 0.05	Al(ac/ch)=11,000 As(ac)=340 As(ch)=100 (Trec) Cd(ac/ch)=TVS CrIII(ch)=100(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=1000 (trec) Pb(ac/ch)=TVS Mn(ac)=5903 Mn(ch)=3674 Hg(ch)=0.01(tot)	Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac)=3500 Zn(ch)=600
22 b	Squaw Gulch from the source to the confluence with Cripple Creek	UP	Aq Life Cold 2 Recreation N Agriculture	D.O. = 6.0 mg/l D.O.(sp)= 7.0 mg/l pH = 6.5-9.0 E.Coli= 630/100m l	CN=0.02 NO2=10 NO3=10 0	B=5.0	As(ch)=200 (Trec) Cd(ch)=50 (Trec) CrIII(ch)=100(Trec) CrVI(ac/ch)=TVS	Cu(ch)=500 (trec) Pb(ch)=100 (trec) Hg(ch)=0.01(tot) Se(ch)=50 (trec)	Zn(ch)=25000 (trec)
23	Mainstem of Wilson Creek (Teller County) from the source to the confluence with Fourmile Creek		Aq Life Cold 2 Recreation E Water Supply Agriculture	D.O. = 6.0 mg/l D.O.(sp)= 7.0 mg/l pH = 6.5-9.0 E.Coli= 126/100m l	NH3(ac/ch)=TVS CL2(ac)=0.019 CL2(ch)=0.011 CN=0.005 S=0.002	B=0.75 NO2=0.05 NO3=10 Cl=250 SO4=WS	As(ac)=340 As(ch)=0.02-10 (Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50 (Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Cu(ac/ch)=TVS Fe(ch)=WS(dis) Fe(ch)=1000 (trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis)	Hg(ch)=0.01 (tot) Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS
24	Mainstem of East and West Beaver Creeks, including all tributaries, wetlands, lakes, reservoirs, from the source to the confluence with Beaver Creek; mainstem of Beaver Creek from the source to the point of diversion to Brush Hollow Reservoir		Aq Life Cold 1 Recreation E Water Supply Agriculture	D.O. = 6.0 mg/l D.O.(sp)= 7.0 mg/l pH = 6.5-9.0 E.Coli= 126/100m l	NH3(ac/ch)=TVS CL2(ac)=0.019 CL2(ch)=0.011 CN=0.005 S=0.002	B=0.75 NO2=0.05 NO3=10 Cl=250 SO4=WS	As(ac)=340 As(ch)=0.02(Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50 (Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000 (trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis)	Hg(ch)=0.01 (tot) Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS

Note: No temporary modifications exist

29.5. Table 6: Fountain Creek Watershed Stream Classifications and Water Quality Standards

	Stream Segment Description	Desig	Class	Physical & Biological	Inorganic (mg/l)		Metals (ug/l)		
1a	Mainstem of Fountain Creek, including all tributaries, lakes, and reservoirs, from the source to a point immediately above the confluence with Monument Creek, except for specific listings in segment 1b.		Aq Life Cold 1 Recreation E Water Supply Agriculture	D.O. = 6.0 mg/l D.O.(sp)= 7.0 mg/l pH = 6.5-9.0 E.Coli= 126/100ml	NH ₃ (ac/ch)=TVS CL ₂ (ac)=0.019 CL ₂ (ch)=0.011 CN=0.005 S=0.002	B= 0.75 NO ₂ = 0.05 NO ₃ = 10 Cl= 250 SO ₄ = WS	As(ac)=340 As(ch)=0.02 (Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000 (trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis)	Hg(ch)=0.01 (tot) Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS
1b	Severy Creek and all tributaries from the source to a point just upstream of where US Forest Service Road 330 crosses the stream.	OW	Aq Life Cold 1 Recreation E Water Supply Agriculture	D.O. = 6.0 mg/l D.O.(sp)= 7.0 mg/l pH = 6.5-9.0 E.Coli= 126/100ml	NH ₃ (ac/ch)=TVS CL ₂ (ac)=0.019 CL ₂ (ch)=0.011 CN=0.005 S=0.002	B= 0.75 NO ₂ = 0.05 NO ₃ = 10 Cl= 250 SO ₄ = WS	As(ac)=340 As(ch)=0.02 (Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000 (trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis)	Hg(ch)=0.01 (tot) Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS(tr) Zn(ac/ch)=TVS
2a	Mainstem of Fountain Creek from a point immediately above the confluence with Monument Creek to a point immediately above the State Highway 47 bridge.		Aq Life Warm 2 Recreation E Water Supply Agriculture	D.O. = 5.0 mg/l pH = 6.5-9.0 E.Coli= 126/100ml	NH ₃ (ac/ch)=TVS CL ₂ (ac)=0.019 CL ₂ (ch)=0.011 CN=0.005 S=0.002	B= 0.75 NO ₂ = 0.5 NO ₃ = 10 Cl= 250 SO ₄ = 330	As(ac)=340 As(ch)=0.02-10 (Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000 (trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis)**	Hg(ch)=0.01 (tot) Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS
2b	Mainstem of Fountain Creek from a point immediately above the State Highway 47 bridge to the confluence with the Arkansas River.		Aq Life Warm 2 Recreation E Water Supply Agriculture	D.O. = 5.0 mg/l pH = 6.5-9.0 E.Coli= 126/100ml	NH ₃ (ac/ch)=TVS CL ₂ (ac)=0.019 CL ₂ (ch)=0.011 CN=0.005 S=0.002	B= 0.75 NO ₂ = 1.0 NO ₃ = 10 Cl= 250 SO ₄ = 485	As(ac)=340 As(ch)=0.02-10 (Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=5280 (trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis)	Hg(ch)=0.01 (tot) Ni(ac/ch)=TVS Se(ac)=42.3 Se(ch)=28.1 Ag(ac/ch)=TVS Zn(ac/ch)=TVS

3a	All tributaries to Fountain Creek that are within the boundaries of national forest or Air Force Academy lands, including all wetlands, lakes, and reservoirs, from a point immediately above the confluence with Monument Creek to the confluence with the Arkansas River, except for the mainstem of Monument Creek in the Air Force Academy lands and for specific listings in segment 3b.		Aq Life Cold 1 Recreation E Water Supply Agriculture	D.O. = 6.0 mg/l D.O.(sp)= 7.0 mg/l pH = 6.5-9.0 E.Coli= 126/100m l	NH ₃ (ac/ch)=TVS CL ₂ (ac)=0.019 CL ₂ (ch)=0.011 CN=0.005 S=0.002	B= 0.75 NO ₂ = 0.05 NO ₃ = 10 Cl= 250 SO ₄ = WS	As(ac)=340 As(ch)=0.02 (Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000 (trec) Pb(ac/ch)=TVS Mn(ac)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis)	Hg(ch)=0.01 (tot) Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Mn(ac/ch)=TVS (tr) Zn(ac/ch)=TVS
3b	Bear Creek and all tributaries from the source to a point upstream of GPS coordinates N3847682, W 10454917 (this location is at elevation 8,200 feet above sea level at a 250-degree angle and 3,000 feet from the trailhead of the Mount Buckhorn Trail off High Drive.	OW	Aq Life Cold 1 Recreation E Water Supply Agriculture	D.O. = 6.0 mg/l D.O.(sp)= 7.0 mg/l pH = 6.5-9.0 E.Coli= 126/100m l	NH ₃ (ac/ch)=TVS CL ₂ (ac)=0.019 CL ₂ (ch)=0.011 CN=0.005 S=0.002	B= 0.75 NO ₂ = 0.05 NO ₃ = 10 Cl= 250 SO ₄ = WS	As(ac)=340 As(ch)=0.02 (Trec) Cd(ac)=TVS(tr) Cd(ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1000 (trec) Pb(ac/ch)=TVS Mn(ac)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis)	Hg(ch)=0.01 (tot) Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac)=TVS Ag(ch)=TVS (tr) Zn(ac/ch)=TVS
4	All tributaries to Fountain Creek that are not within the boundaries of national forest or Air Force Academy lands, including all wetlands, lakes, and reservoirs, from a point immediately above the confluence with Monument Creek to the confluence with the Arkansas River, except for the specific listings in segments 5,6,7a, and 7b.		Aq Life Warm 2 Recreation E Agriculture	D.O. = 5.0 mg/l pH = 6.5-9.0 E.Coli= 126/100ml	CN=0.2 NO ₂ (ac/ch)=10 NO ₃ (ac/ch)=100	B= 0.75	As(ch)=0.02 (Trec) Be(ch)=100(trec) Cd(ch)=10 (trec) CrIII(ac)=100(Trec)	CrVI(ch)=100 (trec) Cu(ch)=200 (trec) Pb(ch)=100 (trec)	Ni(ch)= 200 (trec) Se(ch)=20 (trec) Zn(ch)=2000 (trec)
5	Marshland on Nash Property (60 acres at 103030 Old Pueblo Road, El Paso County) located in Section 28 T16S R65W; Jimmy Camp Creek from the irrigation diversion east of Old Pueblo Road to its confluence with Fountain Creek; unnamed tributary from the boundary of Fort Carson to the confluence with Fountain Creek; located in S1/2, SW1/4, Section 6 and N1/2, NW1/4, Section 7, T16S, R65W.		Aq Life Cold 2 Recreation E Agriculture	D.O. = 5.0 mg/l pH = 6.5-9.0 E.Coli= 126/100ml	NH ₃ (ac/ch)=TVS CL ₂ (ac)=0.019 CL ₂ (ch)=0.011	CN=0.005 S=0.002 B= 0.75 NO ₂ = 0.05	As(ch)=100 (trec) As(ac)=340 Cd(ac/ch)=TVS CrIII(ac/ch)=50TVS CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=1000 (trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Hg(ch)=0.01 (tot)	Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS
6	Mainstem of Monument Creek from the boundary of national forest lands to the confluence with Fountain Creek.		Aq Life Warm 2 Recreation E Water Supply Agriculture	D.O. = 5.0 mg/l pH = 6.5-9.0 E.Coli= 126/100ml	NH ₃ (ac/ch)=TVS CL ₂ (ac)=0.019 CL ₂ (ch)=0.011 CN=0.005	B= 0.75 NO ₂ = 0.05 NO ₃ = 10 Cl= 250 SO ₄ = 329	As(ac)=340 As(ch)=0.02-10 (Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS(dis) Fe(ch)=1430 (trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS(dis)	Hg(ch)=0.01 (tot) Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS
7a	Pikeview Reservoir, Willow Springs Pond #1, and Willow Springs Pond #2	UP	Aq Life Warm 2 Recreation P Water Supply Agriculture	D.O. = 5.0 mg/l pH = 6.5-9.0 E.Coli= 205/100ml	NH ₃ (ac/ch)=TVS CL ₂ (ac)=0.019 CL ₂ (ch)=0.011 CN=0.005 S=0.002	B= 0.75 NO ₂ = 0.05 NO ₃ = 10 SO ₄ = WS	As(ac)=340 As(ch)=0.02 (Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=WS (dis) Fe(ch)=1000 (trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS Mn(ch)=WS (dis)	Hg(ch)=0.01 (tot) Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS
7b	Prospect Lake, Quail Lake, Monument Lake	UP	Aq Life Warm 2 Recreation E Agriculture	D.O. = 5.0 mg/l pH = 6.5-9.0 E.Coli= 126/100ml	NH ₃ (ac/ch)=TVS CL ₂ (ac)=0.019 CL ₂ (ch)=0.011 CN=0.005 S=0.002	B= 0.75 NO ₂ = 1.0	As(ac)=340 As(ch)=7.6 (Trec) Cd(ac/ch)=TVS CrIII(ac)=50(Trec) CrVI(ac/ch)=TVS Cu(ac/ch)=TVS	Fe(ch)=1000 (trec) Pb(ac/ch)=TVS Mn(ac/ch)=TVS (dis) Hg(ch)=0.01 (tot)	Hg(ch)=0.01 (tot) Ni(ac/ch)=TVS Se(ac/ch)=TVS Ag(ac/ch)=TVS Zn(ac/ch)=TVS
Segment 1a: Temporary modification (type iii): Se(ch)=8.7; expiration date: 12/31/2012									
Segment 2a: Temporary modification:									
Segment 6: Temporary modification (type iii): Cu(ac/ch)= current condition; expiration date: 12/31/09; NH ₃ (ac/ch)=TVS (old) (type i); expiration date:12/31/2011									
Segment 7a: Water + fish standards apply									
Segment 7b: Fish ingestion standards apply									

29.6. Table 7: Fountain Creek Watershed Discharge Locations Major Facilities (> 0.05 mgd)

Wastewater Treatment Plant	Permit No.	Discharge Location	Mgmt. Area	Design Capacity (mgd)	Existing Load (as of Jan 2019) (mgd)
Colorado Springs Utilities Las Vegas Facility	CO-0026735	Fountain Creek Segment 2a- via Fountain Mutual irrigation channel	MM	75.0	36.6
Colorado Springs Utilities J.D. Phillips Facility	CO-0046850	Monument Creek south of Pikeview Reservoir	MM	20	6.6
Academy Water and Sanitation District	COG-589020	Discharge to Smith Creek from treatment facility ceased Oct. 31, 2018; wastewater from District pumped to Donala W&S District	UM	NA	0.04
Upper Monument Creek Regional WWTF (Donala Water and Sanitation District, Forest Lakes and Triview Metropolitan Districts)	CO-0042030	Monument Creek at southwest corner of service area	UM	1,750	0.7
Tri-Lakes WWTF (Monument, Palmer Lake and Woodmoor Water and/or Sanitation District)	CO-0020435	Monument Creek at southern edge of Tri-Lakes service area	UM	4.2	1.38
United States Air Force Academy	CO-0020974	Academy's effluent recycle system	UM	2.2	1.4
WWTF (Cheyenne Mountain Estates-Broadmoor Park)	CO---34274	Intermittent tributary of Fountain Creek about 0.5 miles upstream of Hwy 115.	LF	0.06	0.03
Fort Carson	CO-0021181	Clover Ditch about 1 mile upstream from Fountain Creek confluence	LF	4.0	1.4
Fountain Sanitation District	CO-0020532	Fountain Creek, southern edge of treatment facility	LF	1,908	0.58
Security Sanitation District	CO-0024392	Fountain Creek, upstream from Carson Blvd. bridge	LF	1.95	1.32
Widefield Water and Sanitation District	CO-0021067	Fountain Creek, 0.25 miles downstream from Colorado Hwy 16. bridge	LF	2.5	1.4
Lower Fountain MSDD	CO-0000005	Trib. of Fountain Creek; 1.8 miles from mainstem	LF	2.5	1.01

29.7. Table 8: Fountain Creek Watershed CDPS Information

		SU Las Vegas Street WRRF	Fort Carson	Fountain Sanitation District	Security Sanitation District	Lower Fountain Metropolitan Sewage Disposal District	Widefield Water and Sanitation District
NPDES Permit #		CO-0026735	CO-0021181	CO-0020532	CO-0024392	CO-0000005	CO-0021067
Permit Expiration Date		05/31/2020	9/30/2016	04/30/2020	04-30-2020	06/30/18	1/31/2008
Flow (MGD)		75	4.00	1.90	1.95	2.50	2.50
Existing Load (MGD)		41.8	1.40	0.58	1.32	1.01	1.40
Year at 80% Design		2006	2035	2030	2019	2027	2016
Year at 95% Design		2015	2045	2035	2045	2035	2018
Organic (lbs/day BOD ₅)		238,000	8,500	5,808		7,610	4,170
Existing Load (lbs/day BOD ₅)		88,402	2,600	3,252		0	2,993
Year at 80% Design		2006	2025	2020		2020	2016
Year at 95% Design		2015	2030	2025		2025	2018
30-day avg / 7-day avg							
BOD or CBOD		25/40	30 / 45	30/45	30 / 45	30 / 45	25 / 40
Total Suspended Solids		30 / 45	30 / 45	30 / 45	30 / 45	30 / 45	30 / 45
			N/A	NA	2,206 / 4,412	NA	6,000 / 12,000
E. coli		126 / 252	126/252	126 / 252	NA	126 / 252	NA
Total Residual Chlorine, mg/l ¹		0.012/NA	NA	0.22 / 0.31 / NA	N/A / 0.21	N/A / 0.077	N/A / 0.077
Total ammonia as N, mg/l 30-day avg / daily max							
January		5.3 / 7.3	10 / 14	Report/Report	Report/Report	17.2 / N/A / N/A	Report/Report
February		5.3 / 9	10 / 21	Report/Report	9.8 / Report	(Note minimum 30 day	9.8 / Report
March		3.6 / 6	10 / 23	25 / Report	8.6 / 12	avg in July; all other	8.6 / 12
April		4.1 / 9.0	9.2 / 22	19 / Report	13.3 / Report	30 day avg greater	13.3 / Report
May		4.5 / 10	9.4 / 20	12 / Report	12 / 20	than 25 mg/l; all daily	12 / 20
June		4.8 / 15.00	8 / 23	20 / Report	14 / Report	max (acute limit)	14 / Report
July		4.1 / 15	8 / 27	18 / Report	16 / Report	greater than 40 mg/l	16 / Report
Aug		3.9 / 15	8 / 26	21 / Report	18 / Report	as determined by	18 / Report
Sept		3.2 / 14	8 / 24	Report/Report	22 / Report	AMTOX model prepared	22 / Report
October		4.6 / 9	8 / 19	21 / Report	15.2 / 15.2	by GMS Feb 2007}	15.2 / 15.2
November		4 / 9.0	10 / 16	19 / Report	24 / Report		24 / Report
December		5.2 / 8	10 / 15	20 / Report	Report / Report		Report / Report
Metals (Conc in ug/l) 30-day avg / daily max							
Copper, PD		Report	16 / 39	368 / 377	Temp Mod - Type iii (exp 12/31/2012) of 137/117, limit as of 1/1/2013 will be 24/38	NA	24 / 38
Mercury, Total		Report	Report	0.2 / No acute std.	0.011/Report	NA	Report / Report
Selenium, PD		Report	Report	8.0 / 127	5.9/19	NA	NA
Iron, TR		Report	N/A	2,690 / No acute std.	NA	NA	NA

Footnotes

¹ Reported as 30-day avg / daily max

² Minor Wastewater Plant Provider

	Fountain Creek Segment COARF004		Fountain Creek Segment COARF006			
	Academy Water and Sanitation District	Cheyenne Mountain Estates/Broadmoor Park	SU JD Phillips WRRF	Upper Monument Creek Regional WWTF	Tri Lakes WWTF	U.S. Air Force Academy
NPDES Permit #	COG-589020	COG 582000	CO-0026735	CO-0042030	CO-0020435	CO-0020974
Permit Expiration Date	10/31/2010	7/31/2004	5/31/2020	8/31/2006	12/31/2009	12/31/2005
Flow (MGD)	0.116	0.06	20	1.75	4.2	1.4
Existing Load (MGD)	0.05	0.03	4.81	0.8	1.38	0.9
Year at 80% Design	2025	2020	2025	2018	2020	2020
Year at 95% Design	2030	2025	2030	2022	2025	2025
Organic (lbs/day BOD ₅)	375	100	51,374	3,553	5,600	4,386
Existing Load (lbs/day BOD ₅)	220	70	0	1,167	2,317	1,900
Year at 80% Design	2010	2020	2025	2018	2020	2020
Year at 95% Design	2015	2025	2030	2022	2025	2025
30-day avg / 7-day avg						
BOD	30 / 45	30	20 / 40	25 / 40	30 / 45 / N/A	25
Total Suspended Solids	75 / 110	30	30 / 45	30 / 45	30 / 45 / N/A	10
Fecal Coliforms, #/100 ml	200 / 400	2000		N/A	200 / 400 / N/A	N/A
E. coli	NA		126 / 252	163 / 326	NA	
Total Residual Chlorine, mg/l ¹	Report / 0.5	N/A	0.012	N/A	0.011 / NA / 0.019	N/A
Total ~~as N, mg/l, 30-day avg / daily max~~			Report till 12/1/14			
January	NA	NA	5.0 / 12	5.4 / 22.0	Report / Report	NA
February	NA	NA	5.0 / 11	5.4 / 22.0	Report / Report	NA
March	NA	NA	4.7 / 12	5.4 / 26.0	Report / Report	NA
April	NA	NA	3.3 / 11	6.9 / 35.0	Report / Report	NA
May	NA	NA	3.4 / 12	3.0 / 32.5	Report / Report	NA
June	NA	NA	3.5 / 15	3.8 / 32.5	Report / Report	NA
July	NA	NA	3.4 / 18	3.3 / 34.5	18 / NA	NA
Aug	NA	NA	2.6 / 12	2.9 / 35.5	17 / NA	NA
Sept	NA	NA	4.0 / 16	3.3 / 32.5	22 / NA	NA
October	NA	NA	4.3 / 14	3.3 / 32.5	Report / NA	NA
November	NA	NA	5.0 / 14	4.1 / 20.0	Report / NA	NA
December	NA	NA	4.5/12	5.1 / 21.0	Report / NA	NA
Metals (Conc in ug/l) 30-day avg / daily max						
			16 ug/L (May 1, 2020)			
Copper, PD				Report / Report	24.8 / 36.4	
			Report			
Mercury, Total				Report / NA	Report / Report	
Selenium			N/A	Report / Report	Report / Report	
Iron, TR			N/A	Report / NA	Report / NA	
Footnotes						
¹ Reported as 30-day avg / daily max						
² Minor Wastewater Plant Provider						

29.8. Table 9: Chico Creek Watershed CDPS Information

Discharge Segment	Middle Arkansas Segment COARMA04c		Discharge to Groundwater	Cherry Creek Watershed	Big Sandy Creek Watershed
	Woodmen Hills Metropolitan District Regional Water Resource Facility	Sunset's Ellicott Springs	Cherokee Metropolitan District ¹	Walden Corporation	Town of Calhan
NPDES Permit #	CO-0047091	CO-0047252	COX048348	CO-0041921	COG--0582015
Permit Expiration Date	01/31/2020	12/31/2010	July 31, 2023	11/30/2003	10/31/2010
Flow (MGD)	1.30	0.25	4.8	0.11	0.80
Existing Load (MGD)	0.775	0.01	1.8	0.03	0.05
Year at 80% Design	2015	2015	2045	2020	2020
Year at 95% Design	2020	2020	2050	2025	2025
Organic (lb _{av} /day BOD ₅)	3,470	2,168	8,835	230	170
Existing Load (lb _{av} /day BOD ₅)	2,784		3700	41	85
Year at 80% Design	2015	2012	2045	2020	2020
Year at 95% Design	2020	2015	2050	2025	2025
30-day avq / 7-day avq					
BOD	30 / 45	30 / 45 /	30 / 45		
Total Suspended Solids	75 / 110	75 / 110	30 / 45		
Fecal Coliforms, #/100 ml	6000 / 12000 (until 12 / 31 / 2010)		23 (total coliforms)		
E. coli	126 / 252 bag 01/01/2011)	640 / 1280 (bag 12/01/2010 will be 126 / 252)			
Total Residual Chlorine, mg/l	N/A / 0.5 (bag 01/01/2011 will be 0.01 / 0.019)	N/A / 0.5 (bag 12/01/2010 will be 0.01 / 0.019)			
Total ~~20000000~~ lbs N, mg/l, 30-day avq / daily max					
January	Report / Report	6.3 / 12.0			
February	Report / Report	5.1 / 11.0			
March	Report / Report	2.9 / 6.8			
April	Report / Report	1.8 / 5.4			
May	Report / Report	1.7 / 6.8			
June	Report / Report	1.9 / 9.2			
July	Report / Report	1.3 / 7.9			
Aug	Report / Report	1.1 / 6.3			
Sept	Report / Report	1.4 / 7.1			
October	Report / Report	2.5 / 9.7			
November	Report / Report	3.6 / 10.0			
December	Report / Report	3.8 / 8.6			
Metals (conc in ug/l), 30-day avq / daily max					
Chromium Hex Dissolved	Report / Report				
Copper, PD	Report / Report				
Lead, PD	Report / Report				
Cyanide	NA / Report				
Iron, TR	Report / NA				
Note:					
¹ limits also exist for nitrate (10, daily max); sulfate (250, 30-day avq); and chloride (250, 30-day avq). Based on PFI's developed for groundwater.					

30. COMMON ABBREVIATIONS

ACOE	Army Corps of Engineers
BAT	Best Available Technology
BNR	Biological Nutrient Removal
BMP	Best Management Practice
CCR	Colorado Code of Regulations
CDO	Cease and Desist Order
CDPHE	Colorado Department of Public Health and Environment
CDPS	Colorado Discharge Permit System
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CMA	Colorado Mining Association
CMD	Cherokee Metropolitan District
CPW	Colorado Parks and Wildlife
CC&V	Cripple Creek and Victor Gold Mining Operations
CCMD	Colorado Centre Metropolitan District
CRS	Colorado Revised Statutes
CWQCA	Colorado Water Quality Control Act
CWCB	Colorado Water Conservation Board
DMG	Division of Minerals and Geology
DRCOG	Denver Regional Council of Governments
EPCPH	El Paso County Public Health

gpd	gallons per day
MGD	million gallons per day
mg/l	milligrams per liter
FHMD	Falcon Highlands Metropolitan District
JDPWRF	J.D. Phillips Water Resource Reclamation Facility
LVSWRRF	Las Vegas Street Water Resource Recovery Facility
LFMSDD	Lower Fountain Metropolitan Sewage Disposal District
MSMD	Meridian Service Metropolitan District
MLRB	Mined Land Reclamation Board
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
OWTS	Onsite Wastewater Treatment System
PACOG	Pueblo Area Council of Governments
PBHMD	Paint Brush Hills Metropolitan District
PELs	Preliminary Effluent Limitations
PPACG	Pikes Peak Area Council of Governments
pCi/l	picocuries per liter
SAFB	Schriever Air Force Base
SBR	Sequencing Batch Reactor
SEO	State Engineer's Office
SFEs	Single Family Equivalent
SDWA	Safe Drinking Water Act

CSU	Colorado Springs Utilities
SWAP	Source Water Assessment Program
TDS	Total Dissolved Solids
TMDL	Total Maximum Daily Load
USGS	United States Geological Survey
USAFA	United States Air Force Academy
ug/l	micrograms per liter
USPWPA	Upper South Platte Watershed Protection Association
WHMD	Woodmen Hills Metropolitan District
WQCC	Water Quality Control Commission
WQCD	Water Quality Control Division
WQMA	Water Quality Management Association

31. GLOSSARY OF TERMS

Biosolids – The accumulated treated residual product resulting from a domestic wastewater treatment works. Biosolids does not include grit or screenings from a wastewater treatment works, commercial or industrial sludges (regardless of whether the sludges are combined with domestic sewage), sludge generated during treatment of drinking water, or domestic or industrial septage. (Definition from CDPHE WQCC Regulations #61 and #64).

Collection System – A system of sewers used to collect wastewater and convey the wastewater by gravity or pressure flow to a common point.

Design Capacity – The rated capacity (capability) of a proposed treatment plant at which it can meet the preliminary effluent limitations assigned by the WQCD as developed in accordance with subsection 22.4(1)(b)(iii) or, for an interceptor sewer or lift station, the peak hourly flow that the facility is capable of conveying. For a proposed treatment plant, the proposed design capacity is comprised of two components, the hydraulic capacity and the organic loading capacity. The hydraulic capacity shall be given in gallons per day (gpd) or million gallons per day (MGD) that the proposed treatment plant is able to treat. The organic loading capacity shall be given in pounds or tons of 5-day biochemical oxygen demand (BOD5) per day that the treatment plant is able to treat. The proposed design capacity will generally be expressed as a maximum monthly average or another capacity measure where deemed appropriate by the WQCD. For facilities also considered in accordance with the Guidelines on Individual Sewage Disposal Systems, the proposed design capacity shall be the average daily flow, at full occupancy, prior to the application of the 150 percent design flow factor required by those Guidelines. (Definition from CDPHE WQCC Regulation #22, Site Location and Design Approval Regulations)

Ecosystem – Dynamic assemblages or complexes of plant and/or animal communities that 1) occur together on the landscape; 2) are tied together by similar ecological processes, underlying abiotic environmental factors or gradients; and 3) form a readily identifiable unit on the ground. (Definition from <http://www.landscape.org/colorado/ecosystems/Ecosystems%20101/>)

Governmental Agencies – Departments, divisions, or other units of state government; special districts, water conservation districts, metropolitan water districts, conservancy districts, irrigation districts, municipal corporations, counties, cities and other political subdivisions; the United States or any agency thereof; and any agency, commission, or authority established pursuant to an interstate compact or agreement.

Groundwaters – Subsurface waters that are or can be brought to the surface of the ground or to surface waters through wells, springs, seeps, or other discharge areas.

Management Agency – Any public agency designated for wastewater management responsibilities in a certified areawide water quality management plan prepared under Section 208 of the federal Clean Water Act. Such designation shall be considered final only upon the agency's acceptance of its responsibilities as outlined in the appropriate 208 Plan.

Nonpoint Source (NPS) – A diffused pollution source that is not regulated as a point source, including but not limited to sources that are often associated with agriculture, inactive or abandoned mining, or silviculture. Nonpoint source pollution does not emanate from a discernable, confined, and discrete conveyance (such as a single pipe) but generally results from land runoff, precipitation, atmospheric deposition, or percolation.

Onsite Wastewater Treatment Systems (OWTS) – An absorption system of any size or flow or a system or facility for treating, neutralizing, stabilizing, or dispersing sewage generated in the vicinity, which system is not a part of or connected to a sewage treatment works. (Definition from CDPHE WQCC Regulation #43, Site Location and Design Approval Regulations)

Point Source – Any discernable, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft from which pollutants are or may be discharged. "Point source" does not include irrigation return flow. (Definition from CDPHE WQCC Regulation #61)

Regional Project – A water quality management system that will combine and/or eliminate one or more existing treatment works or water quality management systems. An intergovernmental agreement or contract shall be signed, or a resolution adopted by the project participants of the regional project.

Silviculture – The entire lifecycle of a forest from its original seeding through growing, thinning, fertilization, and harvesting.

State Waters – Any and all surface and subsurface waters that are contained in or flow through this State, but does not include waters in sewage systems, waters in treatment works or disposal systems, waters in potable water distribution systems, and all water withdrawn for use until use and treatment have been completed. (Definition from CDPHE WQCC Regulations #22 and #61)

Water Quality Management Plan – The plan for managing the water quality, including consideration of the relationship of water quality to land and water resources and uses, on an areawide basis, for each planning area designated pursuant to Sections 208(a) and 303(e) and 319 of the federal Clean Water Act.

Domestic Wastewater Treatment Plant - An arrangement of devices and structures for treating, neutralizing, stabilizing, or disposing of domestic wastewater, industrial wastes, and biosolids. A domestic wastewater treatment plant is one type (or element) of domestic wastewater treatment works. The term "domestic wastewater treatment plant" does not include industrial wastewater treatment plants or complexes whose primary function is the treatment of industrial wastes, notwithstanding the fact that human wastes generated incidentally to the industrial process are treated therein (Definition from CDPHE WQCC Regulation #22, Site Location and Design Approval Regulations).

Domestic Wastewater Treatment Works - A system or facility for treating, neutralizing, stabilizing, or disposing of domestic wastewater which system or facility has a designed capacity to receive two thousand gallons of domestic wastewater per day or more. The term "domestic wastewater treatment works" also includes appurtenances to such system or facility such as outfall sewers and pumping stations and to equipment related to such appurtenances. The term "domestic wastewater treatment works" does not include industrial wastewater treatment plants or complexes whose primary function is the treatment of industrial wastes, notwithstanding the fact that human wastes generated incidentally to the industrial process are treated therein (Definition from CDPHE WQCC Regulation #22, Site Location and Design Approval Regulations).

Watershed - A geographical area in which activities may significantly impact a waterbody (or segment of concern) or an underlying aquifer. There are several considerations in defining the geographical scope of a watershed: hydrology, political boundaries, uses to be protected, nature of the water quality problem, manageability, available resources, and public interest.

Watershed Protection Approach - An integrated, holistic strategy to protect or attain the desired beneficial uses within a watershed, including protection of human health and aquatic ecosystems.